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ORIGINAL ARTICLES.

THE ANTI-TOXINE TREATMENT OF DIPHTHERIA.

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In an address like the present, time will not permit of a review of the rapidly accumulating literature on immunity, and we must limit ourselves to the consideration only of that portion of the interesting work done on this subject which bears directly upon the application of the blood-serum therapy to disease in the human body.

As far as animals are concerned, artificial immunity has been produced by various workers against the micro-organisms of chicken cholera (Pasteur), anthrax (Ogata and Josuhara and others), erysipelas, malignant œdema, hog cholera, typhoid fever, hemorrhagic septicæmia, vebrionic septicæmia, Asiatic cholera (Hoffkine), diphtheria (Behring and others), tetanus (Behring, Kitasato, Roux), pneumococcus infections, pyocyaneous infection, proteus infection, and infection with the bacilli coli communis, the streptococcus and the staphylococcus. Of the diseases caused by the micro-organisms above mentioned, artificial immunity has been produced in human beings by the injection of the blood serum or body fluids of animals artificially immunized against rabies, Asiatic cholera, tetanus, diphtheria and streptococcus infection.

In 1890 Behring established the fact that the blood serum of an animal immunized against diphtheria had the property not only of producing immunity for this disease in other animals, but could also cure or prevent death in other animals when injected with virulent cultures of diphtheria bacilli. Behring and Kitasato later established the same facts for tetanus and tetanus poison.

In 1891 Ehrlich produced immunity in animals against the toxalbumins of the vegetable poisons ricin and abrin. These poisons are very powerful in their action, and, as has lately been shown by Flexner, cause like the poison of diphtheria, typhoid fever and pneumonia, extensive neurosis of certain organs, especially the liver, kidney, heart, spleen and lymphatic glands.

Recently (1894) Calmitte has not only rendered animals immune against four varieties of powerful snake poisons, but has been able to cure them by the injection of the blood serum of immunized animals even after the toxic action of the poisons was marked.

Since 1890 Aronson, Behring and his collaborators, especially Ehrlich, Boehr, Kossel and Wasserman in Germany, and Roux and his pupils in Paris, have been actively engaged in the study of the production of artificial immunity against diphtheria. For the production of immunity against this disease numerous methods have been employed.

Among other methods, the injection of small amounts of sterilized bouillon cultures of virulent diphtheria bacilli; bouillon cultures, the virulence of which was artificially attenuated by heat and various chemical agents such as the trichloride of iodine, the alkaline hypochlorites, etc.; diphtheria bacilli grown in the extract of the thymus gland; and finally the inoculation of small doses of virulent diphtheria bacilli, have all been used. Behring and Roux have in their latest work, resorted entirely to the injection of the germ-free toxine of the diphtheria bacillus. Aronson prefers the injection of old cultures of virulent diphtheria bacilli. The toxine of diphtheria, discovered by Roux and Yersin in 1888, is obtained by cultivating the bacillus in plain bouillon or in bouillon to which grape sugar has been added, for from three to six or more weeks. For this purpose bacilli of a high grade of virulence are used, and a powerful toxine is thus obtained. Roux finds that if the culture is supplied with an abundance of moist air, a more virulent toxine can be obtained in a shorter time than when the older methods are employed. Not infrequently it has been found that diphtheria bacilli from average cases of human diphtheria will give a toxine of only a low degree of virulence. After the organisms have grown for the time mentioned and the toxines have been proved by injection into animals to be virulent, the diphtheria bacilli in the cultures are killed by treatment with carbolic acid 0.5 per cent., or trikresol 0.3 per cent., or with formalin. Twenty-four hours or so after the addition of one of these agents the bacilli are certainly dead. The bacilli are then separated by a simple decantation, or better by filtration through porcelain. The germ-free filtrate contains the toxine. The exact strength of this toxine is ascertained by injecting it into guinea pigs. Roux's standard toxine kills a 500 gramme guinea pig in 48 hours in a dose of 0.1 cc. Before the immunizing experiments are undertaken, it is necessary to know the potency of the toxine employed. This established, Roux prefers for the first injection to lower the virulence of the toxine by the addition of one-third its volume of iodine. Behring prefers the injection of minute doses of the strong toxine, while Brieger and Wasserman use cultures grown in thymus bouillon and heated to 65° or 70°C. for 15 minutes. Aronson now uses small doses of virulent bouillon cultures to which 0.3 per cent. trikresol has been added.

In the first attempts at the production of immunity and for the production of anti-toxine, guinea pigs and rabbits were used. This was a very delicate operation, as it was difficult to keep within the range of tolerance, so sensitive are these animals to the poison. It was soon found that better and stronger toxine could be obtained from larger animals. For this purpose dogs (Aronson), sheep, goats, cows, asses, and finally horses have been used. Young and healthy horses give the best anti-toxine. They withstand the toxine better, and a larger amount of blood can be drawn off without injuring the animal. Small doses are given at first and then the amount is gradually increased until at the end of from three to six months enormous doses can be given. The injections are usually given in the shoulders. After the first few injections there is usually a considerable amount of swelling and œdema, with sometimes the formation of a hard, knotty mass at the point of injection. With this there is a decided general reaction, as is shown by a rise in temperature, with loss of appetite and body weight. Often the animal, when well advanced toward immunity, will show decided prostration after injection. Roux has pointed out that the susceptibility to the toxine is increased during the later months of pregnancy. Starting with a dose of 0.5 cc. of the pure toxine and giving the injections at intervals of from 3 to 8 days, at the end of from 3 to 4 months, a dose of 250 cc. is well borne. If the blood serum is now tested on an animal inoculated with diphtheria bacilli or diphtheria toxine, preferably the later, usually its anti-toxic power is about 1: 50,000. With care andtime the immunization may be carried to a degree high enough to furnish an anti-toxine with a value of 1: 100,000, or even more. Intravenous injections of the toxine furnishes an anti-toxine of higher grade than subcutaneous injections. Roux has clearly brought out the fact that small frequently repeated doses of toxine furnish an anti-toxine of a much higher immunity grade than large doses given at longer intervals. The rapid introduction of toxine in large doses gives an anti-toxine of a

comparatively low grade. High grades of immunity are not obtained for horses under from four to six months. When the animal has reached the required degree of immunity one of the jugular veins is tapped with a trocar and blood drawn off under antiseptic precautions, to the extent of several litres. The blood is allowed to stand in vessels in an ice-chest until the serum separates. This is pipetted off, and carbolic acid or trikresol added for preservation. If carbolic acid is used, enough is added to make a 0.5 per cent. solution. Trikresol in about one-half this strength is sufficient. Roux adds camphor for preservation. It has been found that if the serum is allowed to stand some weeeks before using, it is less liable to cause disagreeable after-effects, such as urticaria, and joint and glandular swellings. The anti-toxic serum may be concentrated by desiccation *in vacuo*, and can then be preserved for a long time. Aronson has been able to separate the active anti-toxic principle by a long process. This he claims is 30 times stronger than his highest grade serum. Ehrlich first found anti-toxine in the milk of immunized animals.

COMPUTATION OF ANTITOXINE VALUES.

Behring takes as a standard an anti-toxine of which $\frac{1}{10}$ cc. will neutralize ten times the minimal lethal dose of diphtheria toxine. This he styles "normal heil serum," and 1 cc. of this is reckoned as one anti-toxine unit. The minimal lethal dose of any diphtheria toxine is the smallest dose of this toxine that will kill a 300 gramme guinea pig inside of 48 hours. In determining the value of any given anti-toxine in "heil serum" units, it is first necessary to determine the amount of this anti-toxine required to neutralize ten times the minimal lethal dose. For instance, several animals are inoculated with ten times the minimal lethal dose, the animals at the same time receiving varying amounts of the anti-toxine to be tested. The guinea pig that bears this toxine with the smallest amount of anti-toxine without serious illness, shows the true value of the given anti-toxine. Thus, if a pig is given the above amount of toxine and $\frac{1}{1000}$ cc. of anti-toxine, it has received only $\frac{1}{100}$ as much anti-toxine as would have been required had the anti-toxine been of the normal strength. Hence this special anti-toxine would be 100 times stronger than the normal "heil serum" and so would contain 100 anti-toxine units to one cubic centimeter.

The method used by Roux is based on weight. Thus, the quantity of a virulent diphtheria culture which will kill a guinea pig of a given weight is determined. Then the quantity of anti-toxine necessary to prevent serious illness in a guinea pig inoculated with the determined amount of the diphtheria culture is found. Thus if the amount of anti-toxine required to save such a guinea pig is $\frac{1}{20}$ cc. and the animal weighs 300 grammes, the strength of the anti-toxine would be said to be 1:15000. That is 1 cc. of the anti-toxine would cure 15,000 grammes of guinea pig inoculated with a fatal dose of diphtheria bacilli. The method of Behring is to be preferred as being more accurate.

Numerous explanations have been offered for the modes of action in the production of anti-toxine in the body and for the action of anti-toxine on the toxine. The weight of evidence is in favor of the supposition that the anti-toxine is formed in the body not directly from the toxine, but the body cells, stimulated by the action of the toxine, form the anti-toxine. Our conceptions concerning the production of immunity have changed very much during the last few years. The anti-toxic agent cannot be looked upon as a distinct chemical antidote against the toxine. According to Büchner's idea, the natural resistance possessed by the animal body is due to the alexines, which, according to the experiments of Kossel, Vaugh, Hankin and Büchner, are the products of the phagocytes. This resistance due to the alexines is to be looked upon as generally applying to all infections—and in no way related to artificially produced specific immunity following a given infectious process, or due to the production and action of a specific anti-toxine. Thus on account of our strong normal resistance due to our alexines, many of us, though exposed, resist diphtheria; but those recovering from diphtheria, or animals artificially rendered immune against the disease, develop a specific anti-toxic body which is capable of giving immunity to other individuals and of curing the disease. Büchner thinks that the alexines are formed by the phagocytes. He further thinks that the specific anti-toxines,

those of diphtheria, tetanus, etc., for instance, are specific bacterial products, acted on in some unknown manner by the body cells; and that the natural resistance can never approach the height of specific immunity. While the alexines are bactericidal in their action, the anti-toxines are not.

According to Roux, the blood serum of rabbits immunized against hog cholera and pneumonia, and of guinea pigs immunized against cholera, does not show any anti-toxic action, but protects against the microörganism and not against the toxine. Metschnikoff explains this by assuming that the serum stimulates the phagocytes to enclose and digest the bacteria. The blood serum of animals immune to one disease may act as a cell stimulant against another disease. Roux holds that the specific anti-toxines are formed out of the toxines in the body. The similar properties of the toxines and the anti-toxines as regards physical and chemical agents seem to favor this view. If an immunized animal is bled, the formation of anti-toxine still goes on, although no more toxine given. The manner in which the toxine is given is of importance, and the amount of anti-toxine produced is not in proportion to the amount of toxine introduced. The anti-toxine, he thinks, is not a distinct chemical antidote to the toxine, for if one part tetanus anti-toxine and 900 parts of tetanus toxine are mixed and introduced into fresh guinea pigs, two out of ten will have tetanus, so there must be some free poison in the mixture. If guinea pigs were given a preventive injection of tetanus anti-toxine and then a dose of tetanus toxine fatal for unprotected animals, none die; but if some of these animals were inoculated with the products of some other bacteria, they acquire tetanus. So there must remain free toxine. Calmeth and others have found that although venom-anti-toxine acts on venom as the tetanus anti-toxine acts on the tetanus toxine in animals, that if the two are mixed in a test tube and heated to 70° C. the mixture again becomes toxic. So it would appear that the toxines and the anti-toxines remain intact side by side. All these facts point towards the explanation that the anti-toxines act as cell stimulants against toxines. According to Roux, the action of the anti-toxines is not altogether specific, as has been held by Behring. Calmeth has found that tetanus-anti-toxine will protect animals against venom poisoning, but that the venom anti-toxine has no effect on the tetanus poison. He also found that the serum of an animal immunized against rabies would protect against snake poison. It was found that the anti-venom serum was active against abein, and that abein anti-toxine had some effect on venom. From these facts Roux thinks that all of these anti-toxines produce their effects by acting rather upon the body cells than upon each other. Vaughan thinks that the anti-toxine is formed by the body cells under the stimulation of the toxine.

Behring holds that the blood serum therapy is a specific one and that each anti-toxine is active against only one disease, and that each specific anti-toxine is produced by the living cells of the body under the influence of the toxine. Behring looks forward, however, to the making of anti-toxines outside of the body.

From the beginning of the use of anti-toxine in the treatment of diphtheria, there has been a marked lowering of the death rate. Thus the German hospital statistics, with their mortality of from 35 per cent. to 65 per cent., showed under the influence of the new remedy a mortality rate of from 11 per cent. to 25 per cent. Kossel reported 233 cases with a mortality of 23 per cent. Katz reported 128 cases in Baginsky's wards, with a mortality of 13.2 per cent. Virchow gave the treatment the weight of his authority when he reported 303 cases treated with anti-toxine with a mortality of only 13.2 per cent., and 230 cases treated without anti-toxine with a mortality of 47.8 per cent. In Roux's first series of 448 cases there was a mortality of 24.3 per cent. while at the same time the mortality from cases not treated with anti-toxine in the Hospital Trousseau was 60 per cent. Later Roux's mortality has fallen to below 10 per cent. In Vienna 100 severe cases were treated with a mortality of 24 per cent. Foster, of Washington (*Medical News*, Feb. 2, 1895) has gone to the trouble of tabulating the comparative results of diphtheria cases treated with anti-toxine and by the ordinary methods. He found that in 2740 cases—selected and unselected—collected from the literature, treated with anti-toxine, 509 died, a

mortality of 18.54 per cent.; of 4445 cases selected and unselected, and including as did the others cases upon which tracheotomy and intubation were done, not treated with anti-toxine, 2017 died, a mortality of 45.36 per cent. Probably the most interesting series of cases reported in America is that of Biggs, in which 255 cases of diphtheria were treated in the Willard Parker Hospital and in the tenement houses of New York. There were in these 255 cases 40 deaths, or a mortality of 15.69 per cent. If 15 cases in which death took place in less than twelve hours after serum was administered are deducted, the mortality was only 10.4 per cent. During the same period, according to the statistics of the Health Department, the mortality from diphtheria in New York was from 25 per cent. to 35 per cent. At the recent German Congress of Internal Medicine held at Munich, Huebner and Bagnesky of Berlin, and Wederhofer of Vienna, among others, endorse the serum therapy and note striking lowering of the mortality following its use.

The experience of the writer in the recent Ashtabula epidemic was gratifying. In 40 cases treated with anti-toxine there was a mortality of 7.5 per cent., while of 82 non-selected cases occurring during the same epidemic treated by ordinary means the mortality was 27 per cent. A series of 150 children with diphtheria treated with Roux's anti-toxine have just been published from Paris, with a mortality of 10 per cent. The experiences of individual observers might be multiplied almost indefinitely. The difference in the results obtained according to the day upon which treatment is begun, first emphasized by Kossel, is striking. It is, however, what, *a priori*, one would expect. In Kossel's 233 cases, of those treated on the first day of illness 100 per cent. recovered; on the second day 97 per cent.; on the third day 89 per cent.; on the fourth day 77 per cent.; on the fifth day 60 per cent.; on the sixth day 47 per cent.; and between the seventh and fourteenth days 51 per cent. The accumulated experience since Kossel's publication fully bears out his figures. For instance, Foster, analyzing 2740 cases, of those treated on the first day of the disease none died; on the second day the mortality was 2.83 per cent.; on the third day 9.99 per cent.; on the fourth day 20 per cent.; on the fifth day 33.33 per cent.; after the fifth day 41.38 per cent. The mortality is also higher in children under nine years than in children above this age and in adults.

CLINICAL OBSERVATIONS.

General Condition. An early and rapid improvement in the general condition of patients treated with anti-toxine has been noted by nearly all who have used the remedy. The pallor and blueness of the countenance usual with diphtheria patients quickly disappears, or if the case is treated early in the disease this symptom does not develop. Children with large masses of false membrane in their throats are often bright and playful. This improvement in the general condition, in the writer's experience, often takes place in from 12 to 24 hours. It is not uncommon to see severe and malignant cases sitting up in bed playing within from 24 to 48 hours after the beginning of the treatment.

Effects on the Circulation. The earliest and a very characteristic effect is a marked improvement of the heart's action, and of the pulse. The heart beats are slower and the sounds louder. The pulse falls rapidly in frequency, at the same time increasing in strength and volume. In the writer's experience the pulse rate would fall, even in the worst cases, 20 beats in the first twenty-four hours. In from 24 to 48 hours it was not unusual to find the pulse 80 or 90 per minute. Often within fifteen minutes after an injection a rise in the arterial tension was noted.

Respiration. No change in the respiration due to the remedy itself is described, except in young children, in whom it may be accelerated. The only effect upon the respiration is its improvement incident to the removal of mechanical obstruction due to the presence of false membranes in the air passages.

Temperature. According to Roux, if the remedy is given at the very outset, the temperature rises only slightly above the normal. In fully established cases of the disease the temperature falls in a marked manner, often succeeding the first injection. The fall is rapid, the temperature line descending almost vertically. In severe cases the temperature fall is gradual, and it may not reach the normal for several days. When the temperature remains high, in the absence of mixed infection, it is usually to be regarded as an

indication for more of the remedy. In the writer's experience the fall in the temperature was usually marked. In mild cases and in cases of medium severity, this fall was usually sudden; in severe and malignant cases it was more often gradual.

False Membrane. The changes in the local lesions are marked and striking. In the writer's cases for the first twelve to twenty-four hours there was no change in appearance of the false membrane. In severe and malignant cases, it sometimes was increased during this period. But usually its formation ceased within 24 hours after the first injection. Generally after the first 24 hours the false membrane lost its dry, opaque grayish appearance, and became moist, somewhat translucent and milky white. Slight filmy false membranes would rapidly disappear. The thick false membranes in from 24 to 48 hours begin to separate both from the surface and from the borders. It is quite characteristic to see the false membrane curling up and separating at the borders, where it joins the mucous membrane of the part. The false membrane disappears in the majority of cases by the third day. It may disappear earlier or later, as late as the seventh day in our experience.

Cervical Glands. The swelling of the cervical glands usually begins to subside before the disappearance of the false membrane. The glands, however, not infrequently remain somewhat enlarged and tender and appreciable to the touch for some time. If the glands are not already swollen at the beginning of the treatment, they do not usually enlarge.

Albuminuria. Some observers have held that diphtheria anti-toxine causes albuminuria. This is one of the most actively investigated questions now in the anti-toxine treatment of diphtheria. Much will depend upon its decision.

The question is a very complex one, for as is well known a very large proportion of severe cases of diphtheria, treated by any mode of treatment, have more or less albuminuria. According to v. Jaksch all severe cases of diphtheria have albumen in the urine. The injection of large amounts of the anti-toxine into dogs has failed to produce albuminuria. The presence of carbolic acid used to preserve the anti-toxine has been objected to as a possible cause of nephritis, but it has been found that the injection of carbolic acid in solutions of the same strength used in the Behring anti-toxine causes neither albuminuria nor nephritis in dogs. Altogether the weight of evidence points to the conclusion that diphtheria anti-toxine lessens the percentage of cases of albuminuria in diphtheria and does not cause nephritis. It will, however require the study of a large number of carefully studied cases to settle this as well as other mooted points. Roux is positive that albuminuria is less common when anti-toxine is used. Most observers hold that albuminuria existing before the anti-toxine was given is not only not augmented, but is soon lessened and disappears.

Mixed Infections. It is the opinion of all, that cases of pure diphtheria are very much more susceptible to treatment than cases of mixed infection. From the beginning it has been claimed by all that cases of mixed infection fail to show the rapid improvement under the influence of anti-toxine so striking in cases of pure diphtheria. The anti-toxine does not seem to increase the immunity against the organisms of mixed infection, (the streptococcus and staphylococcus), in the slightest degree. However, it appears to be established that cases treated early with anti-toxine are much more liable to escape mixed infection than cases coming late to treatment or treated by ordinary means. It is also established that cases of mixed infection do better under the anti-toxine treatment than under any other. The explanation here is, of course, that if the diphtheria toxine is eliminated from the case, the body is in a very much better condition to struggle against the micro-organisms causing the mixed infection, and the patient's chances are improved by that much. Clinical observation on animals on this point has been substantiated by Roux. It may be said that while anti-toxine when given early very much lessens the chances of mixed infection, any considerable lowering of mortality in cases of well established mixed infection is not to be looked for.

Croup. When anti-toxine is used, the proportion of cases of "descending croup" is very much diminished. Results show that intubation is very much better adapted to cases of laryngeal diphtheria, whether primary or secondary, than is tracheotomy. The tube is quite sufficient in the large

majority of cases to keep the air passage open until the false membrane is thrown off. Intubation is to be looked upon as the "complement of anti-toxine."

Re-infection. Several cases of recurrence of diphtheria after the use of anti-toxine have been recorded. Gaebel reports two such cases. The re-infection occurred in one case on the 27th and in the other on the 28th day. Both cases rapidly yielded to injections of anti-toxine.

Dosage. The amount of anti-toxine given must depend upon the effect produced in each individual case. The best guides are the effects upon the pulse and the false membrane. According to Ehrlich and Kossel the amount necessary is from 400 in light cases, to 1000-1500 anti-toxine units or more in severe cases. The amount in cubic centimetres will, of course, vary with the strength of the preparation. For instance, 1 cc. of the Behring No. 1 contains about 60 anti-toxine units; 1 cc. of Roux's from 50-60; 1 cc. of the Behring No. II, 100. The anti-toxine used at Ashtabula was found by Dr. Arey, in my laboratory, to have an anti-toxic value of 60 units. Janowski has found Aronson's anti-toxine about the same strength as Behring's No. II. Some of the anti-toxine obtained from the horses of the Health Department of the city of New York is stronger than Behring's No. III. Kenyoun, of Washington, has also obtained a very strong anti-toxine.

Mode of Administration. The remedy is to be injected subcutaneously with a large hypodermic syringe, of from 10-20 cc. capacity. It is of the utmost importance that the syringe should be kept sterile. Several special syringes with asbestos sponges, which will stand steam or hot dry air disinfection, have been invented, but probably the one most generally used will continue to be the old style syringe with the leather plunger. This can be quite safely sterilized with a thorough washing with a five per cent. carbolic acid solution before and after using. The skin at the point of injection should be cleansed and sterilized. It is probably not necessary to use a dressing after the injection though it can do no harm. Several parts of the body have been used for the injections, the sides of the abdomen, chest, the back and the buttocks. In the experience of the writer the buttock is at once the most accessible and least painful point. If the skin is stretched taut with the thumb and fingers of the left hand, the point of the needle may be thrust in quickly to a distance of 1 to 1.5 cm. without pain. After this is done, the needle may be carried in as deeply as necessary and in any direction.

The tissues of the soft flabby portion of the buttock are so loose and soft that an injection of the fluid gives rise to little or no pain, and it is very rapidly absorbed. If this method is pursued, even young children, if they are ignorant of what is to be done, scarcely wince. It is usual to give in severe cases 1000 anti-toxine units at once, and to repeat in 24 hours; one may, however, divide the dose and give half at first and the rest after 10 or 12 hours. Mild cases usually require only from 400 to 600 anti-toxine units. Severe and malignant cases often require from four to five thousand or more. It does not seem to make much difference whether the anti-toxine in solution is concentrated or diluted, provided the necessary number of anti-toxine units are always given. Other things being equal, however, it is better to use an anti-toxine of a high immunity grade. High temperature, rapid pulse and symptoms of toxæmia, unless clearly due to mixed infection, are always indications for more of the remedy.

Immunization. For the production of immunity small doses are sufficient. From 60 to 400-600 anti-toxine units are usually given. The size of the dose will depend upon the body weight and age. The artificial immunity thus produced lasts for a variable time, from a few days to six or more weeks. In a diphtheria infected household, everyone should receive immunizing injections. If others take the disease after a few days, the injections should be repeated. Almost invariably individuals contracting diphtheria after these injections have mild cases, which yield readily to small doses of anti-toxine.

Sequelæ. Nearly all of the dreaded sequelæ of diphtheria are either entirely absent or very mild in cases treated with anti-toxine. The proportion of cases having paralysis is very much reduced. In the 40 cases of which the writer has notes there was only one case of paralysis, while in cases in the same epidemic treated by ordinary measures paralysis was common. Heart lesions, both mural and endocardial, are very much less common in the anti-

toxine cases. In the writer's 40 cases, in only three was there cardiac irregularity following the disease. All of these cases made rapid and perfect recoveries. One case, however, in which treatment was not commenced until the sixth day, died suddenly of acute dilatation of the heart.

With the earlier disappearance of the false membrane in anti-toxine treated cases, it is probable that the diphtheria bacilli disappear earlier from the throat than in cases treated by other means. However, there is not enough evidence at hand to decide this point, and the writer's experience has not been sufficiently large to draw positive conclusions. It will take the study of a large number of cases to arrive at a definite solution of the question. Cases should be isolated until they have been proven free from diphtheria bacilli. By immunizing individuals in diphtheria infected houses, epidemics of diphtheria can be rapidly controlled. The same rules adopted in fighting small-pox with vaccination should obtain in regard to diphtheria and the preventive use of anti-toxine.

Additional Treatment. It should be remembered that although in cases coming early under treatment anti-toxine may be regarded as a specific against diphtheria, that in some cases and especially in cases treated late in the disease and in cases of mixed infection, the use of other measures, the value of which is well established, should not be neglected. It is just in these cases that the skill of the expert clinician will save life. The writer has seen such cases which in his opinion would certainly have died but for the timely use of stimulants by the attending physician. An abundance of good food is of the highest importance. It is advised to gargle or to spray the throat at short intervals with some mild non-corrosive antiseptic solution. In the opinion of the writer, copious irrigation of the affected surfaces would be more efficacious. It seems probable that as ordinarily used the local application of antiseptic agents is of little value. In many cases, certainly, they do not reach the sources of the trouble, which lie buried in the false membrane, but as the latter is thrown off under the influence of the anti-toxine their proper use is of the highest importance as the diphtheria bacilli can then be reached and acted upon. Although the bacilli may not be killed outright, their virulence is at least very much attenuated. After the disappearance of the false membrane, it is important to destroy diphtheria bacilli remaining in the throat, thereby not only lessening the chances of the patient infecting others, but very materially shortening the period of quarantine. The ideal treatment of diphtheria in the future must aim first at the destruction of the infectious agents and secondly at counteracting the poison absorbed into the system. The latter requirement is undoubtedly filled by the anti-toxine. The first is apparently accomplished by the early and frequent application of the solution recommended by Loeffler. The use of this latter agent is very promising in cases of mixed infection. Recently the streptococcus anti-toxine has been successfully used in the treatment of puerperal fever, erysipelas and other streptococcus infections. If these results are confirmed by others, a great step forward will be made in the treatment of mixed infections in diphtheria.

Remote effects of anti-toxine. From the first it has been observed that a certain proportion of cases treated with anti-toxine after from 3 to 15 or more days developed painful skin eruptions, usually urticaria and erythema multiform. The occurrence of joint and glandular swellings and severe muscular pain is met with in a certain proportion of cases. These with the skin eruptions appear to depend rather upon the preparations of anti-toxine used and the individual susceptibility of the patient than upon the size of the dose. Their occurrence is not to be looked upon as due to the presence of infectious agents in the anti-toxine but to some unknown chemical body in the horse's blood serum which is poisonous for certain human beings. Although the symptoms produced by the poison are distressing, they are not dangerous to life and disappear without treatment in a few days.

It may be said in conclusion, that in the diphtheria anti-toxine we have a specific for the diphtheria poison when applied early in the disease; and that the later the use of the remedy the greater the mortality. It should be remembered that the agent is anti-toxic and not bactericidal in its action in the sense that it kills diphtheria bacilli present in the affected part.

A CLINICAL REPORT ON THE DIPHTHERIA EPIDEMIC AT ASHTABULA.

F. D. CASE, M. D.

The following distinctive features make this report worthy of your attention:

First, It is one of the few well authenticated instances of an extensive epidemic of diphtheria due to infected milk.*

Second. It was the first epidemic of the disease in this country in which a general use was made of anti-toxine, and opportunity afforded to contrast the result with other accepted modes of treatment.

Most of the time for three years or more there have been cases of diphtheria in the 1st and 6th wards, which adjoin Lake Erie and contain a large foreign population employed on the coal and iron docks. Among these people the enforcement of quarantine restrictions is extremely difficult. The disease was of a severe type with large mortality. In these wards in 1891 there were three deaths from diphtheria; in 1892 seven deaths; in 1893 nineteen deaths, and in 1894 nineteen deaths. During these years up to September 1894 the other four wards were entirely free from the disease. In September and October, 1894, there were eight cases confined to a small section of the 4th ward. This was speedily stamped out, no cases being reported from that ward in November.

The first case ushering in the epidemic under discussion, resided on West street in the fifth ward and was taken ill December 4, 1894. December 5th there were six additional cases located on Bell street in the third ward; Center and Henry streets in the fourth ward, and Bond street in the fifth ward. December 6th, eight more cases were taken ill on Station street in the second ward; and on Center, Henry, Gary, Main, Tyler and Chestnut streets in the fourth ward. On December 8th it was estimated that there were thirty cases in the second, third, fourth and fifth wards of the city. The first death, that of the first person taken ill, a lady 30 years of age, occurred December 9th. On the 10th it was estimated that there were 40 cases in the four wards mentioned, and the Board of Health declared the disease epidemic in that part of the city south of the main line of the L. S. & M. S. railway. The public schools in these wards were ordered closed. Another death occurred to-day, that of a boy six years of age.

The simultaneous occurrence of such a large number of cases excited great alarm on the part of the public, and led to a rigid investigation on the part of the health authorities.

When attention was called to the food supply, it was found that all the cases up to December 10th were in families that procured milk from a wagon of Smith's milk line, driven by Henry Smith. An inspection of Smith's dairy showed the cows to be in good condition and free from any indication of disease. They were supplied with pure spring water and the barns and yards were in good sanitary condition. Henry Smith, driver of the wagon that supplied the infected families, was suffering from sore throat as early as December 2nd and perhaps a day or two earlier. He continued on the wagon, however, except on the 5th and 6th, when his place was taken by another man.

December 12th the Health Officer reported that since December 4th there had been 49 cases of diphtheria reported, 47 of which were in that part of the city south of the L. S. & M. S. track. Of the 47 cases, 45 were in families that used Smith's milk. By resolution of the Board of Health, Smith was prohibited from delivering milk for 15 days after December 11th. In this connection the following cases are of interest.

Mr. P., and his two sons, aged 6 and 12 years, were taken ill with diphtheria in the early morning of December 5th. Mr. P. had gone from home December 3rd, an was at this time in Binghampton, N. Y. On the evening of December 2nd they all partook freely of milk for supper. The milk was procured of Henry Smith. Other

*See Powers' report to local government Board, Universal Med. Sci., vol. 5, p. 230; also Clark's report in same.

members of the family did not use the milk and did not contract the disease.

Mrs. S. usually procured her supply of milk from another source, but on the morning of December 2nd purchased one quart from Henry Smith. December 5th and 6th she was ill in bed with sore throat but did not call a physician. On December 19th her son, aged 14, was taken ill with diphtheria, received the antitoxine and recovered. There had been no known exposure to the disease, except from the mother.

Many instances like the above could be cited. It is true that the evidence pointing to infected milk as the cause of the epidemic is entirely circumstantial, since after repeated examinations the bacillus of diphtheria was at no time found in cultures from the milk or from the throat of Henry Smith. Yet most of our opinions in clinical medicine and therapeutics like most decisions in law, are based upon circumstantial evidence. As Chief Justice Gibson has said, "You see a man discharge a gun at another; you see the flash, you hear the report, you see the person fall a lifeless corpse, and you infer from all these circumstances that there was a ball discharged from the gun which entered his body and caused his death because such is the usual and natural cause of such an effect. But you did not see the ball leave the gun, pass through the air, and enter the body of the slain; and your testimony to the fact of killing is therefore inferential, in other words circumstantial. It is possible there was no ball in the gun, and we infer that there was only because we cannot account for death on any other supposition."

It is true that many persons used milk from this same wagon who did not contract the disease. It is of course not known whether every can of milk on a given day was infected and if such was the case the inherent resisting power of many persons to infectious disease would explain the exception. The array of a large number of negative cases—these in which exposure is not followed by disease—is of little importance unless at the same time an explanation having more elements of probability is at hand. The chances of such a series of admitted coincidences not due to a common cause is too small for calculation.

In Watson's Practice of Physic, in the chapter on Continued Fevers, is the following: "A man might say, 'I was in the battle of Waterloo and saw many men around me fall down and die, and it was said they were struck by musket balls; but I know better than that for I was there all the time and so were many of my friends and we were never hit by any musket balls. Musket balls therefore could not have been the cause of the deaths we witnessed.' And if, like contagion, they were not palpable to the senses, such a person might go on to affirm that no proof existed of there being any such thing as musket balls."

Continuing our report.

December 13th, Dr. Miller of the State Board of Health, accompanied by Dr. W. T. Howard, Jr., Professor of Bacteriology in the Western Reserve University, arrived for the purpose of investigating the epidemic.

On December 14th the Board of Health authorized the Health Officer to procure from the Pasteur Institute, New York, a supply of anti-toxine. Health Officer reports to date, 64 cases in 42 families with 12 deaths.

December 16th. A quantity of antitoxine was received, and administered to three cases.

December 17th. To date 67 cases; 44 houses quarantined; 13 deaths.

December 18th. 65 cases; 47 houses quarantined; 15 deaths.

December 21st. 87 cases; 51 houses quarantined; 18 deaths.

December 22d. 90 cases to date; 20 deaths; 47 patients convalescent; 23 under treatment.

December 28th. The Board of Health declare the epidemic at an end. There are still seventeen cases under treatment.

There were 111 cases and 23 deaths during the month of December, 1894, of which 100 cases with 31 deaths were in families supplied with milk from the wagon driven by Henry Smith. The public schools reopened January 7th after a vacation of four weeks.

From the beginning of the epidemic a rigid quarantine was enforced against the sick and all coming in contact with them. The convalescent were discharged from quarantine only after four weeks detention, unless a bacteriological examination showed them to be sooner free from the disease. All infected houses were disin-

fected under the direction of an employee of the Board of Health. The adequacy of the means employed is evidenced by the fact that with over fifty houses quarantined there was no general spread of the disease, and in 24 days from the time the first patient was taken ill and 18 days after the disease was declared epidemic, the Board of Health were able to declare the epidemic at an end.

Of the total number of cases of diphtheria occuring in that section of the city in which the disease was epidemic, I have received a detailed report of 82 cases. Of these, 59 cases received the usual treatment with iron, chlorate of potash, quinine and whiskey, internally: and peroxide of hydrogen or bichloride of mercury as a spray. Of those 44 recovered and 15 died, or 25.+ per cent. mortality.

Of five cases treated with bichloride of mercury and whiskey internally and peroxide of hydrogen and lime water as a spray, four recovered and one died, or 20 per cent mortality.

Of eighteen cases treated with antitoxine, 16 recovered and two died, or 11 per cent. mortality.

In order to secure a broader field for comparison I have obtained a report of 48 additional cases occurring in the city between December 1, 1894 and April 15, 1895, making a total of 130 cases occurring in the practice of ten physicians. An analysis of these cases gives the following result:

Total number of cases of diphtheria treated, 130.

Details of treatment.	Ages of patients. under 2 years.	between 2 and 10.	over 10 years.
54 treated with serum			
50 recovered	2	26	22
4 died	1	1	2
76 treated without serum			
58 recovered	2	15	41
18 died	1	9	8

Average age of those treated with antitoxine, 12 years.

Average age of those treated without anti-toxine, 18 years.

Cases treated:

(1) Bateriologically proved to be diphtheria, - - - - - -		47
Of these, treated with anti-toxine,	29	
" " without "	18	
(2) Not bacteriologically determined,		83
Of these treated with serum,	25	
" " without "	58	

Amount of serum used to each patient varied from 12 to 113 cubic centimeters.

All the cases recovered that were treated with anti-toxine before the fourth day of illness.

The foregoing statement, while statistically correct, would be, to a certain extent, misleading without further explanation. In all the fatal cases the anti-toxine treatment was begun after several days illness.

Case No. 1. A boy 12 years of age had been ill six days, was profoundly septic, and had diphtheretic laryngitis which later necessitated intubation. He lived two days after the first dose of anti-toxine.

Case No. 2. A young lady, æt. 28 years, had been ill six days and had received during that time the iron treatment. Like the previous case, she was suffering from both diphtheritic laryngitis and septicæmia when she received the first injection of anti-toxine. She lived five days after the first dose.

Case No. 3. A child four months old, received the anti-toxine on the fourth day. It died of septicæmia on the evening of the third day thereafter.

Case No. 4. A child three and a half years old, suffering from diphtheritic laryngitis, received an injection of anti-toxine on the fourth day after the development of croupy symptoms. Intubation was done the evening of the same day. She lived three days and died septic. This child had had sore throat with swollen glands for several days previous to the beginning of the laryngitis, but a physician was called only when suffocation was imminent.

In the opinion of the attending physicians, life was prolonged in each of the fatal cases by the use of anti-toxine. The two first cases were almost *in articulo mortis* when the remedy was injected, and yet lived two and five days, respectively, and in the latter case with good prospect of recovery.

In cases not treated with anti-toxine, heart failure, occurring about the time of, or shortly after the disappearance of the membrane, was a frequent cause of death. In one case, death in a patient 40 years of age was due to a piece of membrane being drawn into the larynx during a violent fit of coughing. In another case a violent urticaria developed on the tenth

day of illness and was followed two days later by persistant vomiting and threatened heart failure. Patient recovered.

The most frequent sequalæ in cases not treated with anti-toxine were paralytic in character. These varied in degree from slight aphonia or difficulty in deglutition to complete hemiplegia. Difficulty in locomotion, somewhat resembling the gait in ataxia, was observed in two cases. Double vision in two cases. Irregularity or intermittence of heart's action was frequent. In one case the symptoms were so alarming that the recumbent posture in bed was insisted on for a period of two months. Patient made a good recovery.. Hemiplegia occurred in the case of a young lady 18 years of age, and was accompanied by aphasia. There was no loss of sensation. Motion of upper extremity is still confined, after five months, to flexion and extension of wrist and fingers and pronation and supination of forearm.

The sequelæ following anti-toxine treatment were in general quite different in character ,but in two instances where it was not given until after the third day, mild paralytic symptoms were developed. Urticaria was reported in seven cases and was probably present in some degree in others. Rheumatism was reported in five cases and was in some instances quite severe for several days. Both urticaria and rheumatism also followed the use of anti-toxine for immunization. Slight inflammation of the joints was reported in two cases. In no instance have abscesses followed the use of anti-toxine, nor have there been other local symptoms, save mild erythema and some muscular soreness at the point of injection, nor in a single instance have the constitutional effects of the anti-toxine been such as to cause the slightest anxiety to the attending physician.

In most cases all other treatment has been omitted after the anti-toxine was given, but in a few instances whiskey was administered and antiseptic sprays used locally. There is no question in therapeutics upon which the local profession is more fully agreed, than upon the efficacy of anti-toxine in diphtheria.

All the serum used at Ashtabula was procured of the Pasteur Institute, New York.

In conclusion I would summarize our present knowledge of diphtheria as follows:—

Diphtheria is an acute specific contagious and infectious disease.

It is primarily a purely local disease, caused by an external parasite—the Klebs-Lœffler bacillus.

The condition necessary for the production of the disease is the presence of the bacilli in quantity and activity sufficient to overcome the individual's power of resistance.

Diphtheria always results, either directly or indirectly, from a previous case, but unsanitary conditions have a great influence on the propagation and virulence of the disease.

As a rule one attack confers immunity for a limited period.

The constitutional symptoms are due to the absorption of the poisonous products of the primary disease from the local lesion.

Changes occurring in the blood and tissues, and the various sequelæ, are caused by the direct or indirect action of the toxines or toxalbumins.

And finally, the discovery or rather the development of the anti-toxine treatment of diphtheria is the greatest achievement of modern therapeutics.

Shock in Castration.

W. Oakley Hermance, M. D., states that severing the cord in excision of the testicle produces any shock to the system has been denied by prominent surgeons.

To the literature upon this question I would like to add an account of a recent observation made while administering ether to a patient undergoing an operation for double castration in the clinic of Professor Steinbach at the Polyclinic Hospital.

The left cord was first clamped, then severed; at the placing of the clamp nothing was noticed, but at the moment the cord was cut the radial pulse, which up to that time had been regular, stopped, missed two beats and then proceeded as before. A little later the cord upon the right side was clamped and a well-marked convulsive movement of the right arm and side was noticed. At the moment the right cord was severed the radial pulse stopped, missed five beats, fluttered for a few seconds and then became regular as before.—*Polyclinic.*

COMPLETE RUPTURE OF THE PERINEUM.

MORDECAI PRICE, M.D., PHILADELPHIA.

There is no subject associated with gynecological surgery of more interest and importance, or more worthy of thoughtful consideration, than that of the complete rupture of the perineum. The sequence of such rupture, if not early and carefully repaired, is discomfort, indeed, prolonged misery for the patient. It means disability for the discharge of domestic duties, and for the performance of those social offices which are sources of happiness to which she is entitled and which attach to her as a member of the community. With our present light, with the advantages thick about us for knowing the subject, its mastery should not be difficult. The "all around" physician, the class from which the front rank of obstetricans and gynecologists is recruited, has the material at his command for obtaining the mastery. Much has been written upon the subject rich in instruction, much that has been and is being turned to profitable account. Our advantages give us less excuse for our mistakes.

Dr. Marian Sims and Dr. Emmet have taught the entire gynecological fraternity how to operate on these cases. They pushed their researches wherever there existed doubt and obscurity, and the profession has the results of their brilliant work.

The report of one or more cases of ruptured perineum may not be without interest to the profession, and may have some surgical value, at least in a suggestive way.

It must be remembered that we have a case with the sphincter ani torn through —the bowel laid open, the rectum and vagina forming a cloacha—with no control of the intestinal discharges when in a liquid or semi-liquid condition; a sensation of everything coming down and out; and the patient in constant fear of accident if she leaves her home or bed chamber. When we come to estimate the full value of the sphincter and the importance of its functions we cannot wonder that women in the condition that we refer to become chronic invalids.

Case I. Mrs. C., married in 1865, gave birth in one year to a large, well-developed boy; labor instrumental; complete tear of the bowel for one and one-half inches above the sphincter ani. No effort on the part of the attending physician was made to repair the rent; he kept the legs tied together for two weeks, and confined the woman to bed for two months, assuring her that recovery would be complete.

There was no union of the parts, and when she left her bed she found she had no control over her bowels. From a well-developed woman at the time of her confinement, she dwindled away to an emaciated, nervous and altogether miserable creature, wholly incapacitated for the discharge of her domestic duties.

All of this could have been remedied or avoided by a very few timely stitches.

When I saw the patient, twenty-two years after the accident, I found her in the condition stated. All I could promise was that I would do what I could for the restoration of the parts.

The sphincter could be indistinctly mapped out; the depressions at the ends of the muscle were not well marked, showing the markedly enfeebled condition of the sphincter from long disuse. I performed the Emmet operation for complete tear of the perineum, in the way I had many times seen Dr. Emmet do it in the Woman's Hospital in New York. The denudation was carried three-fourths of an inch up the vagina, above the bowel rent, and from vaginal caruncle to caruncle of the outer opening, making throughout the entire length of the wound a denuded surface of from one and one-half inches to three-fourths of an inch on either side, leaving the ends of the sphincter to be exposed as a finish to the denudation.

To do this properly a tenaculum must be buried in the centre of the dimple, or the depressed end of the sphinctor, and the tissue lifted up and cut away, then one or two thin circular strips of skin and mucous membrane surrounding this open-

ing must also be cut away to insure the coaptation of the exposed ends of the muscle. (The only difference between Dr. Emmet's way of doing the operation and that used in these cases was in my use of silk-worm-gut for sutures instead of silver wire. I have never been able to use silver wire as Dr. Emmet does. Silk-worm-gut has always given perfect satisfaction.) The stitches were placed beginning high up in the vagina, about four to the inch, in a V shape, with the apex of the V towards the external opening of the bowel; these stitches were continued down much in the shape of the spokes of a wheel, the vaginal portion of the stitches being further apart than at the bowel margin, as a larger circle of tissue had to be included. The stitches were used as supports to the sphincter sutures. These were placed from without inward, first picking up the end of the sphincter muscle, which is now deeply contracted in the depression from the denudation over the contracted ends. The end of this muscle is picked up by the tenaculum, brought up flush with the surrounding tissues, and a straight needle is inserted one-fourth of an inch behind the point of the tenaculum, passed a full inch and one-quarter along the border of the rectal tear; thence over and inserted exactly opposite on the left side of the bowel, the sphincter on that side is picked up as before and the needle passed through and out, reversely as entered on the other side. Two of these stitches are passed three-sixteenths of an inch apart, exactly in the same way, back of the sphincter.

A careful irrigation is given before the closure of the sutures, using some antiseptic solution. The closure of the stitches is then made from above downward, carefully coaptating the parts so raw surfaces only come in contact with raw surfaces, and the sutures are so drawn and shotted as to not strangulate the tissue. About two-thirds of the vaginal sutures are closed from above, then the bowel is closed with the sphincter sutures, care being taken that every particle of dirt and blood is removed. The handle of the tenaculum is placed in the bowel, suture closed with great care, so as not to strangulate the parts; this is continued upward until the last suture is closed.

Every step of this operation must be done with the most minute care and cleanliness, and the denudation of the two sides must exactly correspond, so that when the operation is finished there will be one continuous line of sutures with no raw surfaces exposed.

A bichloride douche, careful drying of the parts and a little cosmoline along the line of suture completes the operation.

This patient made a good recovery, has complete control of her bowels and in many respects is a well woman, able to be about her domestic duties and measurable to enjoy life. Certainly so many years of chronic invalidism would leave ineffaceably their stamp. She is not, and never can be the perfectly healthy woman a few stitches made in time by an experienced and competent obstetrician would have made her.

Case II. Mrs. Y., delivered when twenty-one years of age, of a large, well formed girl, the delivery was made by a drunken doctor in a country village. His condition was not recognized until after the accident, when a sober and competent man was called in, some twelve hours after; then the parts were so swollen and edematous that suturing was impossible. Her recovery was very slow, being confined to her bed and house for over three months. There were two operations for repair of the perineum by general surgeons; both were complete failures.

In this case there was a peculiar condition of the sphincter. It evidently had been torn through on the right side of the labia, leaving the two ends of the sphincter, one anterior and the other posterior to the bowel opening, and both on the left side of the bowel. The depressions at the ends of the muscles were well marked, so that I do not think the muscles had been disturbed or even found in either of the other operations. During the many years intervening between the accident and her coming under my care she was almost continually confined to her home, owing to the uncontrollable condition of her bowels. In her semi-invalid condition, she took on flesh rapidly, although otherwise her physical condition was poor.

She submitted to operation only because of a large bleeding caruncle at the mouth of the bladder which gave her a great deal of annoyance and she had to have it removed. While under ether both operations were done. Some twenty silk-worm-

gut sutures were used in the repair of the perineum.

The only difference between this case and the one above reported, was in the careful handling of the sphincter muscle, having to introduce the sphincter sutures behind the end of the sphincter wherever found. In almost all cases the sphincter is torn on the vaginal front and contracts equally and lays posterior to the bowel where it can be easily mapped out as a strong, circular, muscular band, producing at either end a depressed dimple of skin and mucous membrane. This case made a very satisfactory recovery. For a time she suffered from a slight leakage from the bowel—due to the cutting through of a suture.

At the time of the operation there was a great deal of prolapsed bowel lying over the sphincter opening. Removal was discussed and it was decided best to leave it. This prolapsed portion completely closed the bowel opening and the only way by which we could have the bowels moved was to pass a very small Sim's speculum and hold back the prolapsed bowel. After the second week it gave no further trouble.

In these cases we leave the sutures in from ten days to two weeks. If they are not shotted too tight they will be in perfect position and giving perfect support to the parts. The bowel should be kept soluble. A warm boracic acid douche should be used daily.

There is no special benefit to the profession in the report of a long list of cases, even though the cases greatly vary in the character of the injuries. There are points of likeness in the history of them all, one element rarely absent—delay. With careful, painstaking and skillful treatment about all such injuries can be relieved, and in ninety-five per cent a perfect cure results. It is from the closure of these tears immediately after labor that we must expect the greatest good to the patient. No matter how bad the laceration may be, as soon as the labor is over the woman should be placed in proper position and a tampon of gauze placed at the mouth of the womb, the vagina irrigated with a one to two thousand mercurial solution and the torn parts carefully examined. The vaginal border of the tear can be easily distinguished and with a finger in the bowel it is an easy matter for the attendant, with the aid of the nurse and those about the confinement room, to stitch the torn parts in the most complete manner, using silk-worm-gut sutures and being careful not to shot them too tight.

I have never yet had a failure in immediate closure of the perineum—either partial or complete—but I have a number of times had complete failures of cloture undertaken in from eight to twelve hours after labor. I do not regard it as good obstetrics or good surgery or even good common sense to leave a wound undressed for so many hours. The operation can be done with but little distress to the patient and without ether, while the parts are benumbed by labor, while an operation a few hours after labor compels the use of an anesthetic. There is no use talking to the patient of what you are going to do but do it promptly, and in good surgical form. In conclusion it may be said; that with the weight of the evidence of every obstetrician and surgeon of extended experience in support of the truth of the statement, in all cases where injuries to the perineum are found to exist, immediate use should be made of every means and appliance to repair the injury.

To Blow or Wash?

In these days of warfare against dirt why don't we wash our noses? Surely they get quite as dirty as our teeth, which we brush so laboriously every day. The civilized nose is, in fact, one of the dirtiest organs of the body; for, so long as civilization, which mostly means crowding, involves the breathing of dirty air, the nose, which is the organ by which the air receives its first preliminary purification, must become loaded with all sorts of nastiness. The man with a cold, who is always sneezing and slobbering with his handkerchief, is not a pleasant companion; but, for all that, by dint of much "running" his nose at least is washed, and is cleaner within than that of the fine lady who has trained herself never to use the highly-decorated little bit of lace which she carries about and calls a handkerchief; for in that nose condense and accumulate the soot, the dust, and the microbes of our far from cleanly cities.—*Brit. Med. Journ.*

HEPATIC ABSCESS.*

CHARLES CARY, M.D., AND ROSWELL PARK, M.D., BUFFALO.

DR. CARY.—The patient who is coming before you has the signs of pus which we have been unable to locate so that I have asked Dr. Park to see him with me and discover, if possible, the abscess I believe to be present. The patient has a fatty heart, which forbids the administration of an anæsthetic, and which is so weak that he passes into a state of syncope if he even attempts to sit up in bed. I have made five or six exploratory punctures into various organs without succeeding in striking pus, yet the gravity of the symptoms, his emaciation, the peculiar pallor of the skin, the continued high temperature all point to a condition of septicæmia.

The patient is a blacksmith, aged forty, and he has considered himself well until five or six weeks ago, when he was seized with a pain in the right lumbar region. His digestion has been disturbed so that he has been unable to take much nourishment and he has suffered greatly from flatulence. Before he came to the hospital he had sweats, doubtless an indication of septic disturbance. Since he has been in the hospital, he has had no sweats, but his temperature has run an irregular course between 103° and 97°. I have found friction sounds low down in the right chest, and I believe that there has been a rising of the pus so as to cause a pleurisy. This latter, however, is not purulent, for on tapping in the ninth space, only a little clear and harmless serum was withdrawn. Just below the diaphragm, I drew off what seemed to be turbid serum; still lower, coagulated blood was found and, at the level of the last rib, clear blood.

Dr. Park:—From what little information I had about this case, I agreed perfectly with Dr. Cary as to the septic nature, and advised exploratory punctures. Although these have not proved demonstrative of pus, I still believe that there is pus somewhere to explain the distinctly septic symptoms that the patient presents. Whether we can find it or not is an open question. Were the man's condition better so that he could take an anæsthetic, I should suggest a free incision. Under the circumstances, we must content ourselves with punctures.

Over the region of the liver, I notice some distended veins which I believe indicate an obstruction to the deep circulation and I will puncture at this spot.

There is evacuated from the liver a semiliquid mass of grumous matter, which looks like muddy coffee and has a horribly offensive odor. I will leave the needle in place and cut down upon what I suppose to be a abscess of the liver. For local anæsthesia, I will use cocaine. The incision is made, following the needle, in the ninth intercostal space. About 50 c.c. of pus has gushed forth immediately and the flow continues now that I have inserted a drainage tube. In less than three minutes, 200 c.c. have been evacuated. On account of the weak state of the patient, we will content ourselves with getting rid of the septic elements that will evacuate themselves spontaneously and will not irrigate.

*Clinic at the Buffalo General Hospital.

Vaselin in Erysipelas.

H. Koster, of the Sahlgren Hospital, has made a study of the relative value of the various common methods of treatment of erysipelas. The duration of the fever appeared to be the same when vaselin was used as when Goulard's water, iodine applications, ichthyol and vaselin, and sublimated lanolin were employed. None of these remedies were capable of checking the process with certainty, and in exceptional cases this spread over almost the whole surface of the body. The complications, especially the phlegmonous process, did not appear to be greater after the use of vaselin than when other measures were used. Consequently the author regards vaselin as quite as efficacious as the other well-known topical remedies, and preferable because inoffensive, cheap, without disagreeable odor, and producing no irritation.—*Upsala lakareforenings forhandlingar.*

REMOVAL OF A TUMOR FROM THE NASO-PHARYNGEAL ARCH.

A. O. STIMPSON, M. D., THOMPSON, PA.

Mrs. D. J. H., a young married woman aged 29 years, about a year ago consulted me for what she considered an ordinary case of nasal catarrh, accompanied with quite a little difficulty in swallowing even bland liquids. At the time that she consulted with me in regard to her troubles she was visiting at the home of one of my patients, consequently I only made a cursory examination of her throat and nose, and all that I could then discover was a congested condition of the posterior naso-pharyngeal space with an errosive condition of the mucous membrane. I made an appointment with her to call at my office at a future day and have a thorough examination made of her case. At the day and hour appointed, with the aid of an improvised reflecting light I was able to thoroughly inspect the back part of the throat, and after spraying it with an etheral solution of cocaine (Hydrochlorate) I discovered a smooth red growth the size of a bean of irregular contour, completely blocking up the left nasal-fossa. This growth was removed after some little difficulty by seizing with a long pair of dressing forceps and then amputating the pedicle, after having drawn it out as much as could be allowed without a rupture of the membrane. The pedicle was about one-eighth of an inch thick. After the removal of the tumor the stump was cauterized with a solid stick of nitrate of silver, and the operation was complete. No hemorrhage followed the operation.

ANTITOXIN TREATMENT OF DIPHTHERIA.

Fischer (*Medical Record*) states that of 225 cases of diphtheria, in which he has employed the antitoxin treatment, thirty-five have died. Twenty-two cases were under 5 years of age; sixteen of the latter were under 3 years. His mortality has, therefore, been equivalent to 15⅛ per. cent. This high death-rate he attributes to the fact that the antitoxin was used in a great many cases which were regarded as hopeless.

The contraindications for the usage of antitoxin, according to the author, are; (1) Cases of mixed infection; cases of a scarlet fever complicating diphtheria; cases of measles complicating diphtheria; cases of chicken-pox complicating diphtheria, and so on. (2) Cases that are moribund. (3) Cases that appear to be true septicemia, where we have rather a result of the diphtheria than a real diphtheria to contend with. (4) Cases which show a distinct evidence of casts and large quantities of albumen should not be injected with antitoxin.

In the application of the remedy the following suggestions are offered: (1) To apply the remedy as soon or as early in the disease as possible. (2) To inject a sufficient quantity. (3) To remember that the remedy is absolutely harmless. (4) That it can be used for prophylactic purposes by injecting the one-tenth part necessary for healing an acute case of diphtheria. (5) That the use of antitoxin does not render local antisepsis, the use of stimulants, and careful hygienic regulations unnecessary.

The technique of the injection consists: (1) A careful sterilization of the skin at the seat of injection,—the interscapular space or the pectoralis region. Sterilization consists in washing the skin with soap and warm water, then sponging with a 1 to 200 sublimate solution. (2) The hands of the physician must be carefully cleaned and rendered aseptic. (3) The syringe should be completely sterilized by boiling fifteen minutes in a soda solution. The needle should be dipped in alcohol, followed by a 2-per-cent. solution of carbolic acid. (4) It is necessary to inject slowly; at the same time to have the proper quantity of serum drawn into the barrel of the syringe, so that no time is lost. The needle should be pushed into the deep cellular tissue, at least two inches in a semi-horizontal position. (5) Massage of the fluid injected should be practised. Finally, it is well to apply a very small pledget of absorbent cotton over the injected spot. The injected spot can also be sealed by dropping collodion over it.

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SATURDAY, JULY 13, 1895.

EDITORIAL.

DEGENERATE OR UNREGENERATE.

The prime function of the pulpit is to convince mankind that it is unregenerate and to urge upon it simple means for the prevention and cure of this condition. The methods proposed are at once simple and sensible, and where truely applied have invariably proved efficient. But in spite of the persistent and fruitful efforts of the pulpit to regenerate the human race, so much remains undone that it appears to have become necessary for medical science to take a hand in the matter and to aid or hinder, as the case may prove, the work of the pulpit by demonstrating that the unregenerate is, as a matter of fact, not simply unregenerated but actually degenerated. To such as are qualified to comprehend the *scientific* value of a fact in science, and to deal with it in a scientific manner, the demonstration will be of value, but to the general this theory of degeneracy is only another twist in the meandering curve of can't, if one may so call a diagramatic illustration of the methods of logic pursued by those who seek to prove the total irresponsibility of any wrong-doer—"because he 'can't' help himself."

Without entering into a discussion of this phase of the subject it may be said in general terms that unregeneracy is much more prevalent than degeneracy, and that a man may be both unregenerate and degenerate, or may be either one without being the other. Certainly the pulpit has not exhausted its field of labor and need not retire from business.

Recently Max Nordau's work on "Degeneration" has awakened considerable popular interest and not a little discussion in intellectual circles outside of the medical profession. Its pseudo scientific character and somewhat novel attempt to demonstrate the stigmata of degeneration to be present in some of the most prominent writers and artists of this generation has brought to the author considerable prominence, some approval, and much obloquy.

This last is not to be wondered at as many of the living lights of literature and art have some natural compunctions against wearing shoes made over Dr. Nordau's last.

Dr. Nordau's work, undoubtedly has some genuine scientific value even if, measured by his own standards, the author is himself degenerate. There is such a thing as degeneration. What it is may well be answered by quoting in full the definition given by Dr. Dana in a recent article in the *Forum*:—

"Degeneration is a variation from the average type of the family or race, this variation containing with it a tendency to sterility and extinction of the family. Now, the average or normal type is necessarily a healthy one, otherwise the family and race would die out because, as physiology has shown, only healthy individuals can long propagate the race. Hence Morel's definition of degeneration very properly says that it is "a diseased variation from the primitive type," but this modification is very necessary, since most variations partake of abnormality. Dr. Nordau and other writers speak of degenerates as diseased persons. I would, however, use the milder word *disordered*, or abnormal. In disease there is, speaking generally, a vicious something added to the system, which poisons and perverts it, but in a "disorder" there may be only a disarrangement or disproportion of parts. The bricks and beams of the structure are sound but they are not put together in their proper relation, and instability results. In degenerates there is always some of this disorder or abnormality. Degenerates vary in degree. The lowest forms includes idiocy and imbecility; they are called *debiles*. The next higher group form the *inferior* degenerates, who are simply weak-minded. The highest group are the *superior* or *intelligent degenerates*, who form the class about which Dr. Nordau writes. Lombroso calls certain of them *mattoids*. The mental peculiarities of these persons have been elaborately characterized by Dr. Nordau, and he has given so many symptoms that the reader, I presume, is inclined to say; "Everybody who amounts to anything is a degenerate, and the book simply proves that disease is a good thing and every one ought to have a little of it." I do not shrink from this logical conclusion if the premises warrant it, but Dr. Nordau has not put the matter in quite a fair light. He shows the lack of a certain sense of proportion in his description of the symptoms of degeneration and he does not sufficiently emphasize the vital points. The *higher degenerates*, in order to be strictly classed as such, must possess seriously abnormal qualities, which are not found in all or in most of the great men of the world. Many have a touch of degeneracy without being really degenerates, just as a person may have a rheumatic tendency without ever being crippled by a frank attack of rheumatism.

The signs by which the degenerates are recognized are called stigmata, and they are of three kinds: viz., the physical or bodily, the physiological, and the mental stigmata. An enormous amount of interest has been excited, chiefly through the work of Lombroso, about the investigation of bodily stigmata. The matter is being overdone, like many good things, but there is fundamental truth in the significance of the bodily anomalies supposed to characterize the degenerate. They consist of peculiarities in the developement of the body system, the shape of the head, the conformation of the ears, the palate, the hands, the toes, and other parts of the body.

The degenerate has also some peculiarities of bodily function, such as weakness of the circulation, lack of power to endure fatigue, unusual reaction to stimulants, sterility and allied weaknesses. These form the physiological stigmata. Finally, and

most important, he must have mental peculiarities which are called the psychical stigmata. The two most characteristic are an extreme emotionalism and impulsiveness which go together, and a tendency to *obsessions,* by which is meant "the sudden irresistible forcing and fixing in the mind of ideas that dominate and distress or exalt the individual, despite their being without sound basis." An obsession is an irresistible and fixed idea, though, perhaps, all fixed ideas are not obsessions,—a concession I make out of deference to certain eminent novelists with theories, and honest advocates of free-silver, of anti-vivisection, and of mind healing, etc.

Other mental characteristics are an intense egotism and selfishness. The degenerate is self-centred rather than deliberately selfish. In the horizon of his consciousness he always sees his own figure conspicuously projected. In some cases, a morbid eroticism, and in all cases defects in moral sensibility are noticeable in those who have morbidly deviated from the type. Underlying all is an instabilty of mind, a lack of mental equilibrium. The intelligent degenerate, and it is he whom I am just now describing, is one who makes the judicious grieve; and when the judicious agree in grieving, they have pretty well fixed the diagnosis. Associated with all degeneracy, again, is the inherent weakness of reproduction of the species. The children of the degenerate, if any exist, are more degenerate and the family finally dies out. No pair of degenerates can surround themselves with healthy children and grandchildren. Here is another test which may comfort the degenerate egotism of our later years.

I have described, so far as the mental symptoms go, only those that must be found in the higher class of degenerates to whom Dr. Nordau addresses his graphomania. Insanity, criminality, inebriety, imbecility are the expressions of lower types. Many of the individuals of this higher type are known to the world as "cranks"; others are characterized by economists as "anti-social"; and a large number is looked upon from the religious standpoint as plain bad men. And in this connection it may be noted that Dr. Nordau has tried to show that a large number of the persons whom our Puritan forefathers would have called wicked, are, in fact, diseased. Such is the state of civilization now that if John Knox were living and had thundered against the librettos of Wagner, the novels of Gautier and Zola, the poems of Baudelaire, the plays of Ibsen, and the æsthetics of Kilanyi, we should smile at his simple Christian Philistinism, but when Dr. Nordau directs the choicest stores of a rich and ripened vocabulary in denouncing them, we are seriously interested. It is in his practical application of the facts of degeneration to the artist world that Dr. Nordau has been most criticised.

In many instances Dr. Nordau has undoubtedly made mistakes of a most silly character. He now often drops his scientific method and becomes most interestingly abnormal. In taking a certain person, such as Wagner, for example, and trying to make a diagnosis of degeneracy in the case, a careful alienist would feel obliged to discover in his person, his mode of life, and his work the essential stigmata of the disease. Did the great musician show in any abnormal degree the violent emotionalism, the impulsive acts, the obsession, the egotism, the eroticism, the moral insensibility and instability which characterize the disease? Or did he show the more minor symptoms, such as mysticism, a tendency to inane revery, a mania for writing and iteration of ideas, a sadness of spirit and constant searching after cause—things which, of themselves, have little significance? Were his person and his life characterized by the stigmata of degeneracy? I do not pretend to de-

cide, but I should consider Dr. Nordau's characterization of Wagner as "the last mushroom on the dunghill of romanticism" to be at least severe and hardly warranted by the facts collected. Everyone will agree that a mistake in diagnosis is made in putting the ban upon Ruskin, the harmless and interesting pre-Raphaelites, and certain others whom the artistic world admires. I doubt if Ibsen is "a malignantly anti-social simpleton," for the great mass of people are not affected by him, find no message in his work, and tolerate his gloom for the sake of his fine dramatic art. Dr. Nordau lacks the saving grace of humor, with which no one can be really insane, and he takes some of the queer turns of the artistic nature too seriously.

But while Dr. Nordau makes his mistakes, he achieves also splendid successes, and I know nothing finer, more refreshing, more scientifically accurate or helpfully ethical than his portrayal of the essential disease and depravity underlying the art of the Parnassians, the decadents and æsthetes, and certain types of realists. There are among them art and poetry, but it is the stuff that comes from nature's slums; it is the stenching secretion of the diseased growth; it is nature, to be sure, for death and disease are natural; but it has nothing in common with healthful life and the effectiveness of the race. And it is here that Dr. Nordau's book possesses its essential value. It teaches us to discriminate in our search for art and æsthetic impressions. The art-work of the degenerate may have value, but it is often tainted, and we must accept it critically, not sympathetically. Furthermore, we can be very sure that the art ideas of the degenerate are usually tinged with folly; they really do not tell us anything new, or move us forward toward perfection. Some critics cry impatiently, that they do not care for the man, if only his work be beautiful; but the things cannot be entirely dissociated. If the man is really a form of decay, his art will show it in time; like the putrid fish, it may shine but it smells.

There has grown up a curious feeling that art is sacred; the formula "art for art's sake" is supposed to answer all objectors; and whoever denies the essential value of a thing that is agreed to be "beautiful" is a Philistine, or simply stupid. It requires much personal and civic courage to suppress a play or a "living-picture" if the critics assert that it has æsthetic value. This, I submit, is not what modern ethics teaches. Art is not an end; it should only color our life, not chisel its form (I believe I am quoting from Bulwer); and the really beautiful may be dangerous, devilish, and nasty. So I say again that those who protest against vileness should not be silenced because a thing is really beautiful; if the beauty does not promote the efficiency of the race, it has no justification for its being.

There can be no question that many of the pseudo-geniuses in art and literature, such for example as Oscar Wilde, are degenerates. Whether genius is an evidence of degeneration seems to me a matter not very difficult to decide. Most men of genius, especially on the artistic side, have shown marked signs of of degeneration; they, technically speaking, have a degree of degeneration, but they are not true degenerates. In particular their genius in itself is not a morbid thing or stigma; to say this would be a manifest absurdity. The true degenerate is never a real genius, but a pseudo-genius, or, as Lombroso calls him, a *mattoid*. It is this kind of person, the art and literary and political and social *mattoid*, that society should scrutinize and beware of."

SOCIETY REPORTS.

THE OHIO STATE MEDICAL SOCIETY.

May 15, 16 and 17, 1895.

The Society convened in the Chamber of Representatives, State Capitol Building, Columbus.

The Address of Welcome was delivered by the President, D.N., Kisman, M.D., of Columbus:—He said.

"This is our Fiftieth Anniversary. It is one of the milestones in any human life, and it is a milestone in the life of a society like ours. There are none present, and there are none living so far as I know, of those who first constituted the society. There may be one or two. Dr. Hamilton is one of the old members present, and Dr. Gay is also in the city.

I can but congratulate you upon the splendid history of this Association. Every year we are getting less and less like unto Rome. In Rome, for six hundred years there was no physician! That cannot be said of the State of Ohio, where we have one physician for every five hundred people. In Rome they resorted only to religious ceremony. When there was an epidemic the gods and godesses were carried out on golden beds, and the dictator would go to the temple and nail a golden shield with golden nails to the door, and implore the gods to arrest the disease. We send the Health Officer. Our efforts have been much more satisfactory than those of the Romans. We congratulate you upon the happy auspices under which we assemble.

W. T. Howard, M.D., Cleveland, read an article entitled

THE ANTITOXIN TREATMENT OF DIPHTHERIA.

(See page 27.)

F. D. Case, M.D., Ashtabula, read an article entitled

CLINICAL REPORT ON THE EPIDEMIC AT ASHTABULA.

(See page 35.)

These papers were discussed together.

DISCUSSION.

H. D. M. MOORE, M.D., Columbus:—Nothing of interest remains, I think, to be said upon this matter, except perhaps the addition of the statistics of the work done in the microscopical diagnosis of diphtheria under the direction of the Health Board, here in Columbus. Beginning with December last, I have examined for the Health Board some 81 cultures, made at the bedside with the ordinary outfit. Of these cases, 30 were diphtheria and 51 were something else.

The system of distribution of test-tubes was to leave them in drugstores, and the outfits were collected by the Health Officers as they came in, in the evening. Under the extreme poverty, this was perhaps the best plan that could be adopted. However, the Health Officer was not likely to pass a drugstore or to call immediately after the test-tubes were left, and it was often 48 hours after they were inoculated before the test-tubes came into my hands, That period was too long, but the system was probably the best that could be adopted, under the circumstances.

J. S. HALDEMAN, M. D., Zanesville: I think, in the language of Dr. H. A. Carrington, of Bristol, Conn., "that the attitude of a physician towards a new remedy should be neither hostile, refusing any tolerance of claims put forward on its behalf, nor that of excessive credulity, expecting any marvellous results from the new-comer."

Now it is claimed that the bacilli found in the various secretions, membranes or blood of any of the various diseases named, or any others, is the pathognomonic indication of the one examined, and is its veritable generator. So, then, destroy these bacilli and your patient immediately becomes convalescent and recovers. All we need to do then is to administer the antitoxin, a remedy created from the cause of the disease—the bacilli, to effect a cure

through a long, complicated and tortuous (if not torturing) process. In all candor, does not this savor a little of homeopathy, similia similibus curantur? I always thought, as infinitesimally small as the dose was in homeopathy, say the decillionth part of a grain of anything, or less, so small and nugatory were the doctrines and the whole system. This whole modern anti-diphtheric serum curative operation is, to my mind, very faintly satisfactory. The new treatment has drawbacks, and great ones, which the old one has not. It has them in the manner of its manufacture. It has them in the cost attending its purchase and administration. It has them in not being able to furnish the anti-toxine in sufficient quantity and in due time for use in city, town and country. The mortality rate is not high in my own practice, which covers a period of about forty-one years. During that time I have practiced in several diphtheria epidemics. In the year 1878, when I was physician to the John McIntyre Childrens' Home, Zanesville, O., there were at one time thirty of the inmates down with it in its most malignant form. All recovered but one, and the matron thought that the patient would have recovered if they could have made him take the medicine. This was a mortality rate of a small fraction over 3 per cent.

E. B. FULLERTON, M. D., Columbus: I want to say that I appear not as a medical infidel but as the honest doubter.

I believe there are a few points where there is likely some mistake in regard to the statistics. In the first place, I doubt very much whether we are to receive in America the fatality of this disease in European countries, 40 to 60 per cent. I doubt whether in Columbus, Ohio, it has ever much exceeded 35 per cent. In some 30 cases there were but four deaths, that is 13 1-3 per cent. In New York, Dr. Jacobi, in speaking upon this same subject, said the epidemic last winter in his belief would not, under the ordinary treatment, exceed 25 per cent. mortality. It has been claimed to be but 22 per cent. under the serum therapy.

Now, in regard to the serum. Reasoning deductively we would take the serum as the least vitalized substance in the body, consisting principally of water and a few salts. How is the effect produced? Does it act as a poison to the micro-organism? Or, do we obtain a good result from it because it feeds the phagocytes? These theories, it seems to me, should be worked out a little more thoroughly.

What has been the effect upon the statistics, as to mortality, of modern methods of diagnosis? Haven't there been introduced a larger number of cases under the same title? If we, by bacteriological examination, introduce many mild cases, we can easily reduce the percentage of deaths under any treatment.

I would like to ask whether Henry Smith, who distributed the milk, was among the cases that recovered; or, was he among the mild cases which ordinarily would be called something else? I know when I was in Columbus, even good physicians would reserve their diagnosis until they knew whether the patient would die or not. I would like to know whether, by introducing these mild cases, there is not a chance for fallacy in the statistics.

Then, I have long believed the ordinary treatment of diphtheria is fallacious. What good can the tincture of iron do? We know iron is very little assimilated; it requires days, or perhaps weeks. What, is the use of giving chlorate of potassium? One man has died under it, and we know it is an irritant upon the kidneys. Then, the local treatment has been very faulty. The tearing off of the membrane and the application of caustics, which has been practiced for years, is, in my opinion, faulty. Gentlemen, I have had very little trouble with diphtheria since I have quit using these means, and have not used quinine. I used simply plenty of hot milk, plenty of whisky, and the general supportive treatment.

L. S. EBRIGHT, M. D., Akron: It would seem that the gentleman who has just taken his seat cannot class himself with King Agrippa, because he said to Paul, "Almost thou persuadest me to be a Christian." The gentleman said at first, he was somewhat of a doubter regarding the anti-toxine; but, before he sat down he satisfied me he was a doubter regarding all treatment. Because Smith did not die but got well, after he distributed diphtheria in Ashtabula, does not argue that you must not give certain remedies. I have been passing through an epidemic of diphtheria where the anti-toxine has been used in some cases, and in some cases it

has not been used. I am the physician in the Children's Hospital, at Akron, and am also Health Officer, and had an opportunity to study the epidemic since the fourth day of March. I have no desire to occupy your time or convert any man to any special treatment, but I do believe he who treats diphtheria, or any other disease, and does not give his patients the benefit of every remedy furnished him by science is in a certain measure responsible if the patient dies. A skeptic and doubter regarding the anti-toxine treatment, believing it should be classed with "blue glass" theory, on the 31st day of March I was driven to the use of the serum. On the 21st day of March I saw a boy with what I believed was diphtheria. Afterward I found him convalescent. Later I found a boy who had scarlet fever. On the 28th the nurse was aroused by a peculiar cough from this boy. I was called at 5 o'clock and saw him at 6. I diagnosed diphtheria. My prognosis was unfavorable; and, whether it was the disease or the strict discipline in the house, my prognosis was verified within two days. The boy died on the 30th day of March. In that hospital there were 40 boys occupying a common bed-room; and 16 girls another common bed-room; the children in the nursery a common bed-room, and all eating in a common dining-room. I could only expect that I was in for an epidemic of diphtheria, and fully anticipated a number of deaths. I went to Cleveland, saw Professor Ohlmacher, and he promised to come back with me, which he did on Saturday. And I want now to make my public acknowledgement of thanks to him for it. We commenced using the anti-toxine, and from the time we commenced using it in that hospital and in my private practice, I have not had a case of diphtheria, except two, that have not been examined bacteriologically, and there has not been a case but cleared up within 24 to 48 hours. There has not been a child, out of 27 cases I have seen, but could drink from a bowl of water shortly after introducing the anti-toxine, as well as any time before the attack. For instance, a colored boy, seven years old, was seen on Friday, when he was so hoarse he couldn't speak above a whisper; temperature, 103 1-5°; pulse 140. He looked like a pile of ashes. I fully anticipated he would follow the way of the white lad who didn't get any of the anti-toxine. I gave him 5 ccm., and afterward 5 ccm. more, and at 4 o'clock the next day he sat up and sang with a clear voice. A German child, seven years old, who has worn a tracheotomy tube since the 9th of January, was seen by me on Thursday. I believe the tracheotomy was performed for polypi in her throat. When I saw her, her pulse was 140, and she had all the evidences of diphtheria. I gave 10 ccm. of the anti-toxine at 4 o'clock in the afternoon. The next morning her throat was clean, and she has not taken a dose of medicine since. I saw her yesterday, 16 days afterward, and she is well.

Mary Mc. D., weighing 133½ pounds, very dark complexion, long black hair, without a tooth in her mouth but had been filled, with a bad breath, heavily coated tongue, pulse almost past counting, temperature 100°. A physician who saw her offered a wager of a bottle of wine she would be dead within 24 hours. She had fainted three times before I saw her. After giving the anti-toxine, the patient recovered.

J. A. MURPHY, M.D., Cincinnati: It is well in the few remarks I shall make, that I should lay down one or two propositions that are somewhat broad. The first is, there are hardly two cases in any epidemic, or under any circumstances, that are alike. Take cholera or scarlet fever, for instance. I have heard men, years ago, stand up in Cincinnati and say they never lost a case; and lo! and behold! there comes an epidemic and they lose every case they have. Now, take this disease, diphtheria. We have a mild epidemic and the diagnosis is made by the good old practitioners, who from their experience are able to make a clinical diagnosis. Few cases are lost. Then there comes another epidemic and about one-half the cases will be lost. Now, let my friend remember this proposition, and I don't think he will deny it—he is greatly enthused, and I would not check his enthusiasm. He has claimed to have the most remarkable results within 48 hours, or even less. Sir, he has had a very rapid action from this antitoxin injection, which is very contrary to what I have read from others and what I have been told in the city of Cincinnati.

I can only touch very briefly the paper from Ashtabula. Dr. Case has laid down to us a proposition that these children, or a

large number of them, got the disease from the man who carried milk around. He has given us no results of a bacteriologicol examination of that man's throat. If he had diphtheria, how would the bacilli get in the milk? Would he spit them out? Our friend says, if you find a Lœffler bacillus in the throat, you are sure you have the diphtheria. Why, gentlemen, these bacilli are found for six weeks after the clinical manifestations of the disease are gone; and further, they are found in the normal throat. There must be some little phagocyte or worm or bug, very virulent, which after-ward destroys this Lœffler bacillus, weeks after the patient has had diphtheria, or where he has not had diphtheria.

If you find two or three, four, five, or six of these bacilli in the mouth, what does it mean? Should the patient have anti-toxine? Will he have diphtheria? Will our friend from Akron, with the eloquence of his logic propose to throw in 5 ccm. of the anti-toxine in these cases? Why not? He says patients with Lœffler bacilli in the mouth or nose are in danger. Of what? Of the toxines these bacilli make, and these toxines producing sepsis.

The next point. The bacteriologists, with a skilled eye and a good microscope, fail to find the Lœffler bacilli in a good many cases of diphtheria. Such cases are diagnosed by your old-fashioned practitioners from clinical experience and observation. The gentleman who used the microscope to make a bacteriological examination will not deny that these are cases of true diphtheria, but he will stop and say, "I don't know,"—which is a very proper answer. This is one of the conundrums. Facts often lie, but the quickest liars are figures. There are no liars like figures. What has taken place in Germany? Hundreds and hundreds of people have rushed with their children to the hospitals, with mild and with malignant cases, greatly lowering the mortality. The same thing takes place without the anti-toxine.

Another question. In all these cases nothing is said about the local treatment and about stimulation. My young friend Dr. Eichberg, from Cincinnati, said, when I asked him directly, "By no means will I throw aside the local treatment, peroxide of hydrogen, the iron and perhaps the bichloride of mercury."

Now comes up the question which Dr. Ohlmacher has stated, about the manufacture of this anti-toxine. How long is it safe? Who can explain the death of the woman the other day, in a very short time after the use of the anti-toxine? It is a conundrum. If Dr. Ohlmacher's statement is true, this anti-toxine ought to be put in a refrigerator and not kept long, but carried to the place and used immediately. Nothing has been said as to whether these are the sequelæ or the consequences of diphtheria-pneumonia, albuminuria, bronchitis and various other conditions which have immediately followed the anti-toxine treatment.

J. North, M. D., Toledo:—I want to rise on the part of the young men. It has been said that figures lie. I believe there is a mistake in that. Figures do not lie, but *figurers do lie*. There has been a great deal quoted about the statistics of the past and the statistics of the present. I believe the statistics gathered during the last few months are the only ones of any value, because before these everything was reported as diphtheria, and now we know what is diphtheria and what is not diphtheria.

Regarding the good results of anti-toxine. Virchow, who was at first very skeptical about it, finally admitted the use of the anti-toxine in his hospital in Berlin. After a time the supply of anti-toxine was exhausted. He was out of the city and when he returned, about two weeks afterward, he found the mortality had increased to almost double what it was before. He went back to the use of the anti-toxine, and the mortality went down to where it was before when they used it. With such reports, I think we cannot go back on the figures. I have had no experience whatever in the use of anti-toxine because in Toledo we have had very little diphtheria since the anti-toxine has come into use. But I believe in the use of it. I think the statistics justify it. Some one spoke of a woman who died from it, but for everyone who dies from the anti-toxine, you can find a hundred graves marked diphtheria, diphtheria, diphtheria. I believe it is one of the best things we have had in this country. And then, in connection with diphtheria, we have the staphylococcus, which complicates the cases very much. Only recently we have an anti-toxine for such cases. Where this anti-toxine has been used, almost every

case has recovered. Now with the combined treatment of the diphtheritic anti-toxine and the staphylococcus anti-toxine, I think we will be able to save a much larger proportion of our cases. Because, statistics tell us that where the Klebs-Lœffler bacillus is found alone, we have much better results than when so complicated, and if we have an anti-toxine to counteract the other bacillus, we have something of very great value.

JOSEPH EICHBERG, M. D. Cincinnati: The question of the anti-toxine treatment of diphtheria is not a question between the old men and the young men of this Society, and the young men require no special defence. The treatment stands on its own merits; and if it falls, it must fall of its own weaknesses. No question can be discussed except by those who have had experience; and they are almost unanimous in favor of the anti-toxine treatment of diphtheria. It is not fair to judge of its success from its effect in cases which would certainly die under any treatment. On the other hand, we should not say that more mild cases are being cited for this plan of treatment than heretofore. Nor does it change the position because the gentlemen who have had recourse to this treatment have retained the local treatment. Even with all these measures of treatment, cases have succumbed. Nevertheless the anti-toxine treatment will save many cases. Such beneficial results were cited by the gentleman from Akron. The same results have not been obtained by any other remedy. The change in the appearance of the throat in 24 hours is almost magical, and it would be difficult for one not familiar with the plan to believe it if seeing were not believing. There is no stronger argument, in my mind, as to the efficacy of the treatment, than a statement by Prof. Virchow, of Berlin. The supply of anti-toxine was for a time discontinued because the demand could not be supplied, and the mortality rate rose 23 per cent. On repeating these facts to the Pathological Society, Prof. Virchow says, "we can not explain the action of the anti-toxine on any approved therapeutic plan, but any physician is culpable who does not use it."

When it is borne in mind that Prof. Virchow is not hasty, and it was through him the first information was brought before the profession as to the bad effects of tuberculin, his remark should have weight.

There is no better way to kill or throw cold water upon anything than by ridicule. The fact "Figures will lie" sometimes, when wrongfully interpreted, is not to be thrown up as an argument against figures. I would like to know Dr. Murphy's way of gaining information as to the value of treatment in any disease, if not from the computation of statistics from many sources. In the epidemic at Akron, where I believe seven out of 27 cases died before the introduction of the anti-toxine treatment, only one case died afterward and this had not received the treatment until some two weeks after the invasion. The longer we delay the treatment after the appearance of local symptoms, the greater is the danger to the patient. The value of the anti-toxine treatment will appeal to every one who will employ it. As to its curative properties, there can be no doubt in the mind of anyone who has properly employed it, though its prophylactic value has not been clearly established.

Fibroid Tumors and Pregnancy.

In Archiv. de Toc. et de Gynéc., October, 1894, Remy reports a case of a woman with a large fibroid tumor becoming twice pregnant. There were two distinct tumors in the abdomen, one on the right side and one on the left, which at full term were about of equal size. In the first labor the fœtus was dead, but in the second a living child was born and the mother made an uninterrupted recovery.

Hofmeier (Zeitsch. f. Geb. u. Gyn. bd. xxx, heft 1) says that myofibromas complicating pregnancy do not impose any particular danger on the patient, either from hæmorrhage or interruption of gestation; in fact, the dangers of such a pregnancy are no greater than those of a normal one. In some cases there is a rapid hypertrophy of muscle fiber of the uterus, but this rapidly recedes after confinement, and should not constitute a danger to the patient.

In Love.

Mab—"And is this really the first time you were ever in love, Freddie?" Fred—"Absolutely, darling; but I sincerely hope it won't be the last!"

ABSTRACTS.

Tea-Inebriation.

The American Therapist publishes a criticism of the report of the Board of Managers of the Pennsylvania Hospital, by Dr. James Wood, in which he remarks that he may be permitted to criticise the liberality displayed in that institution in the supply of tea and coffee, considering the deleterious effects of their indiscriminate use among persons who are supposed to be sane.

The writer has already reported a hundred and twenty-five cases of tea-inebriation. In the study of these cases it was found that seventy-two per cent. of the subjects were persons generally known as nervous; twenty per cent. had frequent attacks of faintness; fifty per cent. were troubled with gastric or intestinal indigestion with all of the attending ailments; three per cent. had seriously contemplated suicide; forty-five per cent. were sufferers from persistent headache or capital neuralgia; ten per cent. had spells of great depression; twenty per cent. were troubled with perceptible palpitation of the heart; and twenty per cent. had insomnia, and when it was not complete, what little sleep they were able to get was greatly troubled by the most harrowing nightmares and dreams. In twelve per cent. increasing muscular tremors were noticed, and among quite a number well-marked hallucinations, especially those of impending death and robbery. Such a picture as this, says the author, presented to the thoughtful physician, is most deplorable in every respect. These poor individuals often confess to a degree of tea-drinking which, without question, makes the habit an actual dipsomania.

Chlorosis not Necessarily a Disease of the Young.

Rieder's (*Munch. Med. Wochen Mch.*) opinion has been well known among German physicians, but little regard has been given to the other side of the question by the English and American physicians. He produces new facts, and reports three cases occurring in later life, with the object of showing that chlorosis is not exclusively a disease of earlier life. He regards as pure chlorosis that form of anæmia (1) which arises without obvious cause; (2) in which, apart from some dilatation of the heart, etc., there is no evidence of visceral disease; and (3) in which the hæmoglobin of the blood is diminished and the number of red cells somewhat lessened. Cases 1 and 2, occurring in women aged 36 and 40 respectively, presented all the typical signs and symptoms of chlorosis, and ended in complete recovery. In the third case of a woman, aged 42, both the red and white cell showed changes. There was even marked poikilocytosis. Eosinophile cells, as well as mononucleated, polynucleated, and neutrophile white cells, were present. Very considerable improvement took place, but the patient was still under treatment. In none of the cases was there any evidence of organic disease. In Cases 1 and 3 certainly, and in Case 2 probably, there had been no previous attack of chlorosis. The author draws attention to the value of treatment from a diagnostic point of view. Blaud's pills and the albuminate of iron (Drees) were employed in all cases.

Apoplexy.

Dr. Charles L. Dana has shown in the *Medical Record* the results of his study of the causes, mode of onset and prognosis of apoplexy. Concluding, he says: I can hardly make a summary of the points I have wished to bring out without going into considerable detail. I wish, however, to emphasize the fact that apoplexy and hemiplegia occurring in early adult life are much more frequently due to syphilis than to embolism, and syphilis is a factor in a third of all apoplexies, at least in large cities.

The apoplexies are increasing in disprotionate frequency, owing partly to the facts: that more people live to the apoplectic age; that there is a larger urban population with all that implies in regard to the use of alcohol, the prevalence of syphilis, and the greater intemperance in eating and working.

Apoplexy does not especially effect brain-workers if they live temperately, but rather spares them.

Apoplexy is sometimes a conservative agent, calling a halt to excessive activity and intemperate living and actually prolonging life.

CURRENT LITERATURE REVIEWED.

IN CHARGE OF ELLISTON J. MORRIS, M.D., AND SAMUEL M. WILSON, M.D.

BUFFALO MEDICAL AND SURGICAL JOURNAL

Dr. F. W. Bartlett has an article on

Enterocl ysis Enerocolitis and the Zymotics.

The author began using a solution of two grains of corrosive sublimate in a quart of warm water as an enema in dysentery, and his good results led him to apply the same treatment to typhoid fever and then to scarlet fever, diarrhœa of all varieties, measles, diphtheria, and every disease in which he believed the color contained poisonous excrement. Warm water was used for a while as a counter test, but was not successful.

In using this treatment it is important to place the patient on his right side, the hips slightly elevated to benefit by the position of the colon. If on the left side only a small enema can be given. An oiled catheter is preferred to the rectal tube of commerce and is introduced as far beyond the sphincter as comfort of the patient allows. The syringe is now attached, the enema slowly given which will be expelled in a few minutes. A chamber slop jar is more convenient than the smaller one most commonly used. A second evacuation usually shortly follows the first, after which any sedatives necessary may be administered. The author has had good results from this method, thinks the bichloride of mercury better for the purpose than other antiseptics, and varies the strength of his solution from a grain in one pint to a grain in two and one half pints according to the age of his patient.

Instead of a cold bath of the entire body as in typhoid fever an ice pack to the abdomen only is preferred when there is hyperpyrexa.

Mr. Richard H. Satterlee makes the following *Note on Smoked Glasses.* A cheap colored or smoked eyeglass is sold made with curved surfaces, and as these are rarely quite parallel they cause eyestrain. It is much better to purchase glasses with flat surfaces.

BRITISH JOURNAL OF DERMATOLOGY.

Dr. J. F. Payne describes a case of

Destructive Folliculitis of the Scalp in a Syphilitic.

The disease is analogous to sycosis of the beard and is a suppuration of the whole follicle but is peculiar in resulting in destruction of the follicle and permanent atrophy of the skin. A bacterium has been found which is capable of causing this, but the author quotes Fournien as mentioning a case in which syphilis was the cause, and therefore thinks it probable that either cause might lead to the disorder. The disease has sometimes been mistaken for alopecia areata.

The patient was a small, pale, cachectic girl fourteen years old, complaining of a disease of the scalp of six or seven years' duration. The trouble was a suppurative folliculitis producing also crusts and scales similar to impetigo. Absolute destruction of some bulbs had caused a large oval bald area some inches long. Tinea and favus were excluded by the absence of broken hairs.

The general condition showed either tuberculosis, inherited syphilis or some similar affection.

At first phosphate of iron was administered and dilute citrine ointment with creosote used locally. This proving useless small doses of iodide of potash were given with prompt benefit which increased when hydrary cum creta was added, and finally bichloride with iodide of potash. The general appearance of the child improved and a cure resulted except that no new growth of hair came in the bald spot.

It is interesting to note that the father contracted syphilis before marriage but none of the secondary symptoms were noticed and none of the children showed syphilis until the patient and one other were born; both of these were diseased and in both the manifestations were of the tertiary form, and about the time of their births severe tertiary symptoms began to manifest themselves in the father.

Annals of Gynecology and Paediatry.

Mr. Charles J. Cullingworth writes of

Removal of the Uterine Appendages for Uterine Glioma.

In his paper the author describes the symptoms and course of twenty cases and draws the following conclusions from his experience: "The operation affords an almost certain means of relieving all the more dangerous symptoms in cases in which active treatment is necessary and in which removal of the tumor or tumors is either impracticable or likely to be attended with special difficulty or great risk.

Although in experienced hands the mortality is not high, it should never be spoken of as a minor operation. Its usefulness will become lessened as the mortality of hysterectomy decreases.

It is impossible to know beforehand whether in a given case it will be an easy or an impracticable operation. It is unsuitable in cases where the tumors are very large or have become œdematous or degenerated. It is particularly applicable to those cases in which the tumors are mainly intra pelvic and in which operation is necessary to relieve or prevent dangerous pressure.

Before being submitted to an operation, the patient should be made aware of its uncertainty. Relief is not generally so prompt, nor convalescence so uniform as in ordinary ovariotomy or abdominal hysterectomy.

AMERICAN JOURNAL OF OBSTETRICS.

Dr. Mathew D. Mann writes of

Perforation of the Uterus After Abortion With Prolapse of the Intestine.

Three cases of this accident came under the author's notice. In one case a woman per-

forated her uterus by the introduction of a catheter with its stylet. The physician to whom she applied for treatment did not recognizethe condition until in curetting the uterus be found torn intestine in it. An abdominal section was performed by the author, and he found it necessary to ligate the mesentary in several places, and to use a Murphy's button to reunite the colon and ileum. The patient recovered.

The other cases were ruptured by surgeons using dilators in treatment of abortion. One operator finding that he had ruptured the uterus and that there was prolapse of intestine tried to get competent assistance and, failing, did an abdominal section. The patient died of sepsis. The other man finding the same condition lost his head and after pulling out six feet of intestine cut it off in the belief that it was part of the fœtus. This woman died of course.

This occurrence does not seem so rare as might be supposed. The uterus after an abortion is particularly liable to rupture by forcible dilatation or by rough curetting. When rupture occurs a well arranged coeliotomy will usually be successful and there is no need of great haste in performing it unless the hemorrhage is severe.

Dr. G. Leopold has a paper on *Myomectomy During Pregnancy.*

The author found it necessary to remove a tumor of the uterus from a pregnant woman, and found it to be a partly calcified myoma extending deeply into the muscle. Pregnancy continued and terminated normally.

The author has found about thirty cases reported and gives a table containing a condensed report of each.

Dr. Julius Rosenberg writes of *Fibroid Tumors Complicating Labor.*

Three cases are described in which fibroid tumors were present during pregnancy and were left undisturbed, labor progressing without much interference and the tumors either disappearing or getting much smaller post partim.

The author is opposed to myomectomy during pregnancy, thinking the trouble usually best left to nature.

Dr. Francis Foerster writes about

Retrodisplacement of the Uterus.

Acute cases following an unhealthy puerperium are usually amenable to palliative or mechanical treatment. Cases of longer standing lead to an overgrowth of the parts concerned and call for surgical treatment. In many of these curetting and amputation of the cervix lead to involution and great improvement, and after the use of pessaries for a while cure may be obtained. The inflammatory conditions may have gone beyond the congestive stage though and it may be unsafe or impossible to operate except by cœliotomy.

In other cases fixation of the uterus either through the vagina or to the abdominal walls is sufficient, and different operators differ in their opinions about the comparative merit of the various procedures.

The author prefers the Alexander operation, but has devised a plan of vaginal ventero fixation which he thinks even better.

After thorough application of antiseptics to the vagina the patient is placed in lithotomy position, the uterus curetted, Douglas' pouch opened and any existing adhesions broken by the fingers.

A uterine sound with a large knob is now introduced and the body of the uterus made to protrude at the vulva, and the appendages treated as found necessary or perhaps removed. The anterior uterine surface is now scarified, the fundus transplaced with the ends of the sutures hanging in the vagina. By a specially constructed canula needle these are now drawn through the abdominal wall and fastened over a gauze compress. Two sutures partly close the vaginal wound and a strip of gauze is used for drainage. The peculiar needle is absolutely necessary to avoid wounding the bladder and intestine.

Dr. Charles I. Probfen reports a Case of

Floating Spleen in an Infant Following Malaria.

The child was a foundling admitted to the asylum when two weeks old, and was then seemingly healthy. It was given to a woman to nurse and not thriving was given to a different one. The child was now found decidedly unwell, fretful, feverish, etc., and suffering from alterating attacks of constipation and diarrhœa. The abdomen was protruding and the spleen found greatly enlarged. No other evidences of syphilis or of leucocythæmia being found the blood was examined for Laveran's plasmodia and these being found the child was given six grains of sulphate of quinine three times daily, alternately with full doses of arsenic. Prompt improvement was seen with diminution of the spleen, and two months after treatment began the organ was found free in the abdomen about twice its normal size.

This condition in an infant in this latitude is very rare and regret is felt that the history of the case could not be known.

Dr. S. C. Ayres discussed the

Relation of Uterine Diseases to Ocular Diseases.

The author has seen cases in which functional or organic ocular diseases were easily traced to uterine trouble. These disorders usually become worse at time of menstruation and when this was irregular or painful they often were cured when the uterine trouble became less.

These disorders are most frequently found about puberty and the menopause, and are very frequently mistaken for serious disease of the eyes.

Dr. A. B. Thrasher writes of

Reflex or Hysterical Affections of the Larynx.

In this class the author has found an organic trouble, in another part of body perhaps, the relief of which led to cure of the laryngeal trouble.

In hysterical aphonia he thinks there is always an objective lesion even if we cannot

find it. Tubercular laryngitis is often diagnosed from sulyectine symptoms when the lungs are diseased, but the laryngoscope would show a healthy larynx.

Dr. A. W. Johnston writes of the

Pathological Aspects of Stevenson's Wave.

Stevenson of Aberdeen University discovered by delicate manometers that the pelvic blood pressure varies in a woman during her menstrual life, from one period to the next in a definite manner.

The pressure is greatest at the commencement of the flow, least immediately on its cessation and remains at about the same height for seventeen days when it again begins to rise.

Derangement of this cycle or insufficient pressure leads to various pathological phenomena, headache, convulsions, nausea, vertigo etc. Two cases were observed in which headache was accompanied by a temporary, regularly recurring, glycosuria and the author explains this as caused by undue pressure in the floor of the fourth ventricle leading to pneumogastric inhibition and this to hepatic inaction. When the wave occurs normally and there is no escape for the blood, owing to thickened endometrium or some similar cause we find abnormal congestions elsewhere—vicarious menstruation, etc. Vicarious menstruation usually shows a local trouble requiring treatment at the place of hemorrhage.

When the pressure fails to reach its normal height we find nervous disquiet, etc., and anæmic phenomena as frequently seen in phthisis. Recognition of the existence of this wave has allowed a more satisfactory treatment and diagnosis in obscure cases than could otherwise have been brought about.

THE RAILWAY SURGEON.

Dr. W. B. Dutten writes of.

Malaria in Reference to Operation and Injuries.

It has been the experience of the writer that when the employes of a certain railroad, which runs for some distance through swamps, are injured they are apt to develop malaria. Injuries which seen very trivial are apt to show this complication and to become of great importance owing to it. Another peculiarity mentioned in this connection is that persons residing in a malarial district may seem free from all traces of the disease and yet develop very severe attacks after moving elsewhere. These attacks have appeared even in Montana at an elevation usually regarded as an absolute protection from malaria. It is now generally believed that four different organisms produce attacks of malaria and that they may be microscopically distinguished. Of these only two lead to pernicious malaria, the organism of quotidian fever and that of summer autumnal malaria. It is obvious then that if the blood of a patient is found to contain either of these a thorough treatment with quinine should promptly begin.

Dr. R. F. Miller writes of

Compound Fractures.

When these injuries occur from railway or machinery accidents we have a badly soiled wound usually with great injury of soft parts, perhaps a large vessel also. The old treatment was to amputate, but the modern method is to anæsthetize the patient, thoroughly scrub the limb, cleanse the wound removing foreign bodies, splinters of bone, etc. The wound is now irrigated, preferably with a $\frac{1}{3000}$ warm solution of bichloride and the ends of the bone apposed (if possible suture the periosteum) and ligate any torn vessels suturing to keep the soft parts in position. If the original opening is too small to admit of thorough examination it must be enlarged. A counter opening for a drainage tube is now made, the tube inserted and the limb dressed with antiseptic gauze and a fenestrated splint.

A daily examination of the wound may be made for a few days. The main point in the treatment is antisepsis. If amputation proves necessary it can be performed later.

INTERNATIONAL MEDICAL MAGAZINE.

Dr. A. R. McComas reports a

Case of Abscess of the Brain

Remarking that some men still fail to operate in cases of compound fracture of the skull with depression the author describes a case which fell into his hands after such an accident. The patient was a miner, sixteen years old, whose head was forced against an iron bolt in such a way as to fracture the frontal bone. A physician sewed up the wound in the integument and the author saw the patient seventy-nine days later. The scalp wound had not healed and complaint scalp wound had not healed and complaint was made of chilliness, pain in the back of the head and some slowness of cerebration was noticeable. The diagnosis made was abscess of the brain, but an operation was refused until a few days later when a convulsion occurred, leaving the boy comatose. Operation evacuated about three ounces of pus. A compress was applied but had to be removed, resulting in cerebral hernia. This was subsequently ligated and removed. Recovery, except for slight impairment of memory, was complete.

Dr. Frank Billings writes of

Arteris Sclerosis.

The disease, though rare before forty years, may be found much earlier. The negroes seem to be particularly susceptible. Dissipation, gormandizing and eating food in quantity relatively great for the labor performed, alcoholism, gout, syphilis, etc., are well-known causes of the disease.

Milk has seemed the most satisfactory diet and iron, either as Basham's mixture or as the tincture alone or with dilute phosphoric acid with glycerine has given good results. The treatment, of course, must be continued and cases are cited where it was used continuously for years.

Dr. Charles Lester Leonard has an article on the

Endogenous Formation of the Malarial Parasite

illustrated by microphotographs.

The question has been considered unsettled as to whether the parasite is capable of assuming different forms in a life cycle or whether there are a number of organisms which produce malarial fever

The author has described the changes as follows: "An amœboid parasite from one fourth to one fifth the size of a red blood corpuscle non pigmented and showing marked activity in the psendopodia. The organism increases in size occupying one half or two thirds of an entire red corpuscle and contains melanin in small rods and granules derived from the pigment of the host. The red corpuscle is destroyed as the parasite increases until it is replaced by that organism. During this time segmentation has commenced and after the destruction of the red corpuscle the parasites break into the first or amœboid forms and attack new corpuscles while the pigment gathered by the parent is set free.

The author in another paper describes a method of taking at definite intervals instantaneous photographs of the same microscopic field. Applying this method he shows a series of photographs showing parasites in all the stages and three of them show the same parasite in three consecutive stages, finally coming to a state of rest as a spore form or malarial crescent.

The change in this instance from an extra corpuscular amœba to an intra corpuscular pigmented one took only two minutes.

BRITISH JOURNAL OF DERMATOLOGY.

Dr. Jonathan Hutchinson writes of the

Neurotic Origin of Hydroycstoma

The disorder described under this name has been frequently seen in New York and it is noted that most of the cases occurred in washerwomen usually of middle age.

All the patients perspired freely and the rash was worse in summer, sometimes quite disappearing in winter. The eruption seems due to an obstruction of the sweat ducts, the cause of this being unknown, but due to some nervous derangement apparently, this view being supported by their not infrequent appearance with xanthelasma.

The subject about whom the article is written is a florid woman of 64 years. Forty years ago she suffered from excruciating headaches which are now rare, but severe when they occur. They seem to be replaced by neuralgia of the tongue which is almost constant and is worse on the right side and began in entire loss of taste on both sides. Herpes occasionally forms inside the lips. The patient has a rheumatic or gouty history and is a curious example of unilateral sweating, perspiration occuring mainly on the right side of the body, though slightly also on the left.

Little cysts which were thought to have been more or less present for about nine years, were found about both upper and lower lips near the canthus, in the outer two thirds of the eyebrows, on the bridge of the nose and on both sides of the forehead. These occurred mainly on the right side, and the rest of the face was almost free.

The existence of this trouble following severe attacks of hemicrania usually limited to the right side and apparently not due to hepatic derangement is noteworthy.

Dr. Leslie Roberts describes a case of

Impetigo of Duhring,

The patient was a child three years old who, after a sharp fever and lassitude, developed when convalescent a crop of pustules on the face and neck. Later another crop appeared on the chest. When seen about a dozen were found disseminated over the body. One was found freshly formed and was about one sixteenth inch in diameter, pustular, surrounded by a red areola which disappeared at maturity. The walls of these pustules were so hard and dense as to recall variola. None of the pustules became umbilicated and they dried up without exudation. The dense walls, absence of exudation, occurrence in a well nourished child, and apparent freedom from communicability distinguish it from impetigo contagiosa. It was impossible to make the decisive laboratory test.

The same author reports a case of

Mycosis Fungoides.

A woman in comfortable circumstances, about 45 years old, whose mother and sister died of phitisis. The history was negative in other respects. Four or five years ago a moist eruption appeared on the left arm and in a few months disappeared. At intervals this reappeared, was confined to the extremites and was uninfluenced by treatment. During the last year the entire skin became affected, tumors appearing recently and growing rapidly.

Considerable variety was seen in the way in which different portions of the skin were affected; in places there seemed to be excoviations, elsewhere branny desquamation, in others it was hypertrophied and on the face moist and weeping.

The tumors were never passive, but either were growing, suppurating or involuting. This peculiarity together with their cusion-like shape and their involving only the superficial skin are diagnostic of mycosis fungoides When these tumors break down they afterwards heal without leaving a scar. No treatment seems to have any effect on the disease but improved hygiene improves the general condition of the patient and lessens the disease somewhat in this manner.

Shortly before death pain became distressing and general emaciation took place and the tumors almost disappeared.

PERISCOPE.

IN CHARGE OF WM. E. PARKE, A.M., M.D.

MEDICINE.

Paralysis Following Tonsillitis.

In support of the statement that paralysis similar to that following diphtheria may arise subsequently to other forms of sore throat, the following cases are recorded by Bourges (*Arch. de Med. Experiment*, January, 1895): A child, aged 7, was attacked with sore throat, pyrexia, etc. There was no membrane, and the illness subsided in twenty-four hours. About a fortnight later he was again attacked, and this time distinct false membrane appeared on the fauces, but not for three days was there any lividity of the neighbouring parts. The glands in the neck were swollen. There was no albuminuria. A few days later the mother, who had constantly nursed the child, was also attacked with sore throat, and membrane formed on the right tonsil. The membrane in each case was examined, cultures made, and mice inoculated. None of these showed the Loeffler bacilli. Various streptococci and staphylococci were found, and some small bacilli staining by Gram's method. About six weeks from the last attack of sore throat the child developed convergent strabismus, paralysis of the soft palate, loss of power in the limbs, and general weakness.

Intestinal Obstruction in Children.

MONTI (*All. Wien. med. Zeit.*,) after discussing the causes and general symptoms of intestinal obstruction in children, and accepting in the main the views of Leichtenstern, gives the following points as those which are of value in forming an opinion as to the site of the obstruction: (1) In the lower part of the colon the first symptom of acute obstruction is painful colic, and the region of the abdomen in which the colic is first felt may afford some indication of the part of the colon obstructed. Vomiting does not occur until the colic has lasted for some hours or days; it is at first bile-stained, then becomes foul, and finally fæculent. Collapse sets in late; gaseous distension of the intestine begins in the colon, and at first it may be possible to make out that it is limited to the region occupied by the colon (flanks and epigastrium), but later the ileum also becomes distended, and the tympanities may reach a very high degree. In incomplete obstruction the symptoms are the same, but develop more slowly. Action of the bowels may occur, and be attended by temporary relief, especially of the tympanites. If the rectum be incompletely obstructed, constipation alternates with attacks of painful tenesmus, followed by the passage of small scybala. Circular constriction of the rectum causes the motions to be of small calibre. (2) Acute obstruction in the lower part of the ileum is attended with frequent attacks of painful colic, starting in the ileo-cæcal region. Each paroxysm of colic induces an attack of vomiting, the vomited matter being at first the contents of the stomach, but later fæcal. Collapse sets in early. The detension of the abdomen is most marked at first in the umbilical and hypogastric regions, but in time becomes general; it is not notably diminished by vomiting. At first several fæcal stools may be passed, but after a few days there is complete constipation. The quantity of urine is diminished after the first few hours or days, and there may eventually besup pression. When the obstruction is incomplete the colic may be as severe, and the movements of the coils of intestines perceptible. The degree of distension may vary greatly in a very short time, and this independently of a passage of a stool. The constipation, after lasting some days, may be succeeded by copious foul diarrhœa. (3) Acute obstruction in the duodenum or jejunum causes severe colicky pain, starting about the umbilicus and radiating towards the stomach. Vomiting comes on early, and is violent; the vomited matter is at first bile-stained, later it becomes foul smelling. Gaseous distension is slight, and is limited to the epigastrium. It may be very much diminished by vomiting, but collects again. The bowels may at first act spontaneously or after enema, but eventually there is complete constipation. Suppression of urine is established early. When the obstruction is not complete, the symptoms are similar but less severe. The colic is painful, and the vomiting, either in relation with the colic or independently, very frequent. The quantity of urine is dimished. There is no distension of the abdomen, and diarrhœa alternates with constipation. Monti considers that if a case is seen early much may be learnt as to the probable seat of the obstruction by observing the way in which the tympanites develops.

SURGERY.

The Surgical Anatomy of the Spine in Infancy.

Chipault and Daleine (*Rev. d'Orthop.*,) in the course of a second paper on the surgical anatomy of the infant, direct attention to the following points. The spine of the fœtus and newborn infant, taken in relation to the whole length of the body is longer than that of the adult on account of the slight development in early age of the lower limbs. The relative length of the different regions of the spine varies at different periods of life, whilst the relative proportions of the dorsel segment and the cervical and lumbar segments taken together vary but little during growth. The cervical segment, which at birth exceeds the lumbar segment, becomes relatively smaller with advancing age, until in the adult the

latter is one-third longer. Whilst in the adult the umbilious corresponds to the level of the third lumbar spine, in the infant it is opposite to the fourth spine or even lower. The base of the sternum corresponds in the infant to the top of the seventh cervical spine, instead of as in the adult, to the second dorsel spine. In the newborn infant the spinal cord descends but a little below the upper part of the spine of the first lumbar vertebra. Whilst in infancy the lower limits of the cervical and lumbar portions of the cord vary but slightly from those in the adult, the lower limit of the dorsel portion corresponds to the eighth, and not as in the adult, to the ninth dorsal spine, The cauda equina in the infant, instead of forming, as it does in the adult, a cylindrical mass which fills up the dural sheath, is arranged in two distinct processes occupying the sides of the canal and separated by an interval of from 3 to 5 millimetres in width, occupied by cerebro spinal fluid. The spinal canal might thus be punctured in the third or fourth lumbar space in the infant without risk of wounding the cauda equina. Laminectomy, it is pointed out, may be performed under much more favorable conditions on the infant than on the adult. In the former the laminæ may be easily resected, the fatty tissue around the dura mater is much less vascular, and the pericsteum, which can readily be detached from the bone, is capable of throwing out fresh osseous structure, and of repairing the breach made during the operation in the posterior wall of the canal.

Suture of the Heart.

Del Vecchio (*Rif. Med.*,) as the results of experiments on dogs, concludes that suture of the heart in cases of wound is possible. At the recent Congress in Rome (1894) he showed a dog whose left ventricle had been wounded in two places (one penetrating into the ventricular cavity) forty days previously. The author had surtured the two wounds with catgut and silk, and the dog appeared at the time of exhibition to be in perfect health; it was killed on the forty-second day after suture. The apex of the heart was found firmly adherent to the thoracic parietes. Both wounds were firmly healed, and in one the scar could be seen on the endocardium, proving the penetration. An interrupted suture was found to answer better than a double continuous suture, as necrosis generally followed the use of the latter. Dogs present a special difficulty in these experiments, inasmuch as one has to open the pleural cavity to reach the heart. In cases of wound of the human heart Del Vecchio proposes the following operative procedure. Two longitudinal incisions to be made from the lower border of the third rib to the upper border of the seventh, the one along the lower margin of the sternum, the other 5 to 10 mm. inside the nipple line; these incisions to be joined by a horizontal one made in the fourth intercostal space. The fourth, fifth and sixth ribs and cartilages to be divided, and the outer cutaneous flaps turned up. The pleura to be separated and pushed on one side with the finger, exposing the pericardium, which is incised longitudinally. The wound is then united by interrupted sutures. Death in cases of wound of the heart seems to be chiefly due to pressure from the blood effused into the pericardial sac. Since this presure is also a check to further hemorrhage, it is a nice question whether operative interference may not do more harm than good as far as the hemorrhage is concerned. Paracentesis may. however, be practised, to be followed, if necessary, by free incision of the pericardium. A short bibliography of the subject is appended. Fischer collected 376 cases of heart wound with a mortality (two to three minutes after injury) of 20 per cent. Death has been noted in periods varying from a few seconds to nine months after the injury.—*Br. Med. Journ.*

Suppurative Arthritis in Infective Disease.

Mauclaire (*Arck. Gen. de Med.*,) deals in this number with the following cases: (1) Acute rheumatism. Pyarthrosis has been reported, but it is probable that the suppuration was due to a secondary infection. True articular rheumatism must be distinguished from the pseudo variety. (2) Pseudo-rheumatism: In this class the author places cases in which the joint affection is the first local manifestation of the general infection. Sometimes these infections are intense and the lesion multiarticular; sometimes less intense, only one joint being involved; or the infection may be very attenuated, the joint lesion being periarticular in character. In this group should be placed the suppurative arthritis sometimes seen in the first few years of life without previous illness. Acute articular rheumatism, epipysial osteomyelitis tubercle, and syphilis must be excluded. Usually one joint is affected. The prognosis is favourable in these children under proper treatment. Suppupation in the pleura and pericardium has, however, been noted. (3) Gonorrhœa: The author says that at the present time it is difficult to say whether the distant lesion is due to the gonococcus, toxins, or a secondary infection. Sometimes the general manifestations of gonorrhæa are slight, sometimes they may be severe, resembling typhoid fever. The lymphatic system plays an important part in propagating the disease. These joint affections have by some been attributed even to a spinal cord lesion. Suppurative arthritis occurs in the acute stage of gonorrhœa, but sometimes later in neglected cases.

Treatment of Diffuse Purulent Peritonitis.

Herhold (*Deut. med. Woch.*,) relates two cases in which recovery ensued after incision and drainage. (1) A patient, aged 54, was admitted with a strangulated hernia. An empty hernial sac was found on the right side and a piece of omentum and intestine on the left. After the intestine slipped back into the omentum discoloured and ill-smelling fluid escaped. The condition of the patient did not improve, and six days later the abdomen was opened along the outer edge of the left

rectus muscle; 300 c.cm. of stinking pus escaped. The intestines were felt to be glued together. The patient recovered. (2) A boy, aged 8, was admitted with signs of peritonitis with effusion. Later he became desperately ill. The abdomen was incised and drained 250 c.cm. of stinking pus escaping. The finger introduced into the wound felt coils of intestine glued together. Rapid improvement and ultimate recovery ensued. The cause of the peritonitis was not clear in either case. The author then gives the statistics of published cases of diffuse purulent peritonitis treated by incision. In the Berlin Charite 25 such cases have occurred, and of these 5 recovered, but the hopeless nature of the cases accounts for this small number; in 2 the peritonitis was due to perforation in enteric fever, in 9 to long continued obstruction, in 4 perforating intestinal ulcers, in 1 to a perforating gastric ulcer, and in 9 no cause was known. Purulent peritonitis which is part of a general sepsis is hopeless.

GYNECOLOGY.

The Influence of Ablation of the Ovaries on Metabolism.

Curatulo and Tarulli (*Il Policlinico,*) publish a preliminary note on some experiments they have been making on this subject. They find that after removal of the ovaries there is a marked and constant diminution in the amount of phosphorus anhydride found in the urine. Bearing in mind the beneficial effect of ovaritotomy in osteomalacia, the authors conclude that the ovaries secrete some unknown chemical product capable of favoring the oxidation of the organic phosphates which furnish the material for the formation of bone salts. Consequently, when the ovaries are removed, there occurs a greater retention of organic phosphorus, and a greater accumulation of calcareous salts under the form of calcic and magnesian phosphate.

Results From Alexander's Operation.

Kummer (*Centralbl. f. Gynak.*) publishes statistics of 14 cases in which he operated, recording no results where the after-history is less than a year long. Four of the operations were for prolapse, and 10 for retroflexion. In all the 4 cases of prolapse plastic operations on the vagina were also undertaken, so that whether the result was due to the shortening of the round ligaments or to colporrhaphy could not be decided. In 1 case the prolapse, notwithstanding the combined operations, recurred; in 3, observed respectively 3 years, one year and a half, and 1 year, cure was complete. Of the 10 retroflexion cases, in 5 complete cure followed Alexander's operation; 3 seem cured, but are excluded as the after-history was under a year, whilst in 2 the displacement recurred. In both these failures there were adhesions affecting the mobility of the uterus, but it seemed so easy to draw the organ forward that Alexander's operation was preferred to hysteropexy. The latter is always safest when any adhesions exist. In the 5 completly cured cases, as well as in the 3 recently performed, all the uncomfortable symptoms, so prominent in many cases of retroflexion, disappeared; the uterus remained in its normal condition of anteflexion. One patient had been married for three years, but had never conceived. After the operation she became pregnant, and was delivered at term. The uterus remained anteflexed after involution. Kummer modifies some of the details of Alexander's operation according to circumstances.

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The B & O. R. R. Co. will sell excursion tickets to Baltimore from all points on its lines east of Ohio River at one fare for the round trip. Tickets will be sold July 16th and 17th, valid for return passage until August 5th. For time of trains and full details, call or write nearest B. & O. Agent.

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